



Environmental Compliance SERVICES, INC.

IMMEDIATE RESPONSE ACTION AND
RESPONSE ACTION OUTCOME
505 FRONT STREET
CHICOPEE, MASSACHUSETTS
RTN #1-13691
1-13697

westfield
1-13697

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EXECUTIVE SUMMARY

On behalf of T. Works, Incorporated, Environmental Compliance Services, Inc. (ECS) has completed an Immediate Response Action (IRA) Completion and Response Action Outcome (RAO) Report at the property located at 115 Wayside Avenue of West Springfield, Massachusetts. The Site is defined as the areas proximal to, and downgradient of the 10,000-gallon underground storage tank (UST) located in the northern portion of the property (referred to herein as "the Site"). The Site has been assigned Release Tracking Numbers (RTN) 1-13697 and 1-13747 by the Massachusetts Department of Environmental Protection (MADEP) due to concentrations of Extractable Petroleum Hydrocarbons (EPH) greater than Reportable Concentrations (RCs) and a failed tank tightness test. This investigation was conducted to satisfy the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

A subsurface investigation was conducted throughout the Site as part of an Environmental Site Assessment in August of 2000. The subsurface investigation detected EPH in soil samples collected in the immediate vicinity of the 10,000-gallon diesel UST. The MADEP assigned the RTN of 1-13691 for this incident on December 8, 2000.

On November 20, 2000, a tank tightness test of the 10,000-gallon diesel UST was performed by Tanknology. The results of the test indicated that there was a likelihood of a leak associated with the in the inner wall of a double wall UST. This condition required notification to the MADEP within 72-hours. The MADEP assigned the RTN of 1-13747 for this incident on December 14, 2000.

From April 23 to April 25, 2001, IRA activities including the excavation of 428.28 tons of contaminated soil and collection of post excavation soil samples for field screening and laboratory analysis were performed. Groundwater samples were collected from groundwater monitoring wells and a Site survey was performed during this period.

Post excavation soil samples were submitted for laboratory analysis of Volatile Petroleum Hydrocarbons (VPH) and EPH. VPH C₅-C₈ aliphatics, C₉-C₁₂ aliphatics and C₉-C₁₀ aromatics were detected in post excavation soil samples S-23 and S-32 at concentrations less than Method 1 Standards. VPH target analytes naphthalene and total xylenes were detected at concentrations less than Method 1 Standards. EPH C₉-C₁₈ aliphatics, C₁₉-C₃₆ aliphatics and C₁₁-C₂₂ aromatics were detected in soil sample S-32 at concentration below Method 1 Standards. Targeted EPH analytes naphthalene, 2-methylnaphthalene, fluorene, phenanthrene and pyrene were also detected in soil samples collected from S-23 and S-32 at concentrations less than Method 1 Standards.

No EPH hydrocarbon ranges or targeted analytes were detected in groundwater samples collected from wells MW-2 and MW-3. Monitoring wells MW-1 and MW-4 could not be located. Chlorinated solvents including tetrachloroethene (PCE), trichloroethene (TCE) and cis-1,2-dichloroethene were detected in groundwater samples collected from well MW-2 at concentration less than RCs.

This RAO addresses the release of diesel fuel from the 10,000-gallon UST. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

In order to evaluate whether a level of No Significant Risk exists for foreseeable Site activities and uses, the MCP Method 1 Soil Standards S-1/2/3/GW-3 were used for characterizing risk associated with oil/hazardous material (OHM) detected at the Site.

Based on the assessment and remedial activities conducted at the Site, it was determined that no further remedial response actions are needed at the Site to achieve a condition of No Significant Risk. The Site qualifies for a Class A-2 RAO based on the following:

- Response actions have been conducted at the Site in order to achieve a level of No Significant Risk;
- Concentrations of VPH detected at the Site meet applicable Method 1 Risk Characterization Standards and do not exceed the Upper Concentration Limit (UCL) in soil.
- Background concentrations have not been achieved at the Site.
- This RAO ensures a level of control of each identified substance of concern at a Site or in the surrounding environment such that no such substance of concern shall present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time.
- No Activity and Use Limitation (AUL) is needed to maintain a level of No Significant Risk.

1.0 INTRODUCTION

On behalf of T. Works, Inc., Environmental Compliance Services, Inc. (ECS) has completed an Immediate Response Action (IRA) Completion and Response Action Outcome (RAO) Report for the property located at 115 Wayside Avenue in West Springfield, Massachusetts. The Site is defined as the areas proximal to, and downgradient of the former 10,000-gallon diesel underground storage tank (UST) located in the northern portion of the property (referred to herein as "the Site"). The Site location is shown in Figure 1, Site Locus. Figure 2, the Site Plan, shows the layout of the property. Figure 3 shows the excavation area and groundwater flow direction at the Site. Figure 4 shows a detail of the excavation area and sampling points. Figure 5 defines the area covered by this RAO. The Site is listed on the Massachusetts Department of Environmental Protection (MADEP) Standard Release Report list as Release Tracking Numbers (RTNs) 1-13691 and 1-13747.

2.0 SITE DESCRIPTION

2.1 SITE LOCATION AND SETTING

The following information is provided as an overview of the Site location:

Site Address:	115 Wayside Avenue
Site Location:	West Springfield, Massachusetts
County:	Hampden
Latitude, Longitude:	42° 08' 38" North, 72° 37' 38" West

The Site property consists of approximately 2.13 acres of land and is improved with two buildings. The property and buildings are currently occupied by Trailer Works, Inc., a truck and trailer service company. The property was formerly used as an office, storage warehouse and service garage. A Site Plan illustrating Site features is provided as Figure 2.

The 10,000-gallon UST was formerly located in the northeastern portion of the property. Two 1,000-gallon (hydraulic and engine oil) UST are located in the northwestern corner of the property.

Abutting properties include: Capital Insulation to the west; West Springfield flood control property to the north; Bearings Specialty Company, Northeast Precision, A&M Compressed Air Products, Computerland and a residential house located to the south; and Town Way located to the east.

The Site property and abutting properties are serviced by municipal drinking water and sewer. Potential sensitive receptors include employees of the on and off-site buildings.

According to the information on the MADEP Bureau of Waste Site Cleanup (BWSC) Priority Resource Map of the Springfield North, published by the Massachusetts Geographic Information System (Mass GIS), the Site is not located within a MADEP approved Zone II, Interim Wellhead Protection Area (IWPA), and/or Potentially Productive Aquifer (PPA). The Site is not located within Habitat of Species of Special Concern or Threatened or Endangered Species. The Site is also not located within an area designated as State, Federal, Municipal non-profit Open Space and Recreational Facilities area or within 500 feet of an area mapped as Estimated Habitats for Endangered Wetland Wildlife according to the Natural Heritage & Endangered Species Program (NHESP).

2.2 SITE HISTORY

According to available historical records, the Site was occupied by Capital Insulation in the 1970s and New England Roto Engraving in the 1960s and 1970s. The easterly portion of the Site along Town Way formerly supported Legers Rubbish Removal Corporation, a Division of Waste Management in the 1960s and 1970s. The Site had been occupied by Commercial Disposal since the mid 1980s until August 2000. In February 1996, United Waste purchased Commercial Disposal. In August 1997, USA Waste purchased United Waste. In July 1998, Waste Management purchased USA Waste. Waste Management is the parent company of Commercial Disposal. No on-site development was documented prior to the 1960s.

3.0 FIELD INVESTIGATIONS

3.1 SUMMARY OF INVESTIGATIONS

3.1.1 – Environmental Site Assessment - 1994

An Environment Site Assessment was conducted at the Site in September of 1994. The assessment included background research, a review of state and federal environmental databases and files regarding the Site and surrounding properties; review of available documentation regarding closure of the Site as a Resource Conservation and Recovery Act (RCRA) Transport, Storage or Disposal Facility (TSDF) and groundwater sampling and analysis.

The site was formerly a Interim Status TSDF as defined by 310 CMR 30.00 RCRA. Storage of hazardous waste on the site was discontinued in 1987. The facility underwent a RCRA closure study performed by HRP Associates Inc. of Plainville Connecticut. Based on the study a closure certification and change of status form were filed by Commercial Disposal in July 1993. The closure study included the removal of above ground hazardous waste storage tanks and removal of soil from a hazardous waste drum storage area located in the eastern corner the site property. Groundwater monitoring wells were installed on the site and groundwater samples were obtained for quantitative analyses. Several chlorinated solvents were detected in groundwater on the site.

On January 25, 1994 a letter indicating that the closure satisfied the requirements of 310 CMR 30.587 was issued by the MADEP, Boston, Massachusetts. The letter indicated that no post closure requirements were imposed by the MADEP. Groundwater contamination, however, was detected on the site and the letter indicated that the groundwater contamination should be compared to the standards of the MCP 310 CMR 40.0000.

The property was a small quantity generator of waste oil. According to a May 24, 1993 Compliance Inspection of the property, a waste-oil space heater was permitted for use to burn up to 2,000-gallons of waste oil per year on the property. Approximately 1,650 gallons of waste oil were burner on the property for heating. The waste oil material was formerly stored in a 250-gallon above ground storage tank (AST). According to the file two parts cleaners were used on site and utilized naphtha for cleaning solvent. No floor drains or wastewater discharges were noted in the area of the waste-oil burner.

Emergency Response incident reports regarding the property indicate that approximately 30 gallons of diesel fuel was spilled at the property on December 1, 1992. The spill was cleaned by Oil Recovery of West Springfield, MA. The MADEP closed this case on December 4, 1992. On July 22, 1993, 20 to 50 gallons of hydraulic oil was released to the property from a hydraulic line on a dump truck. The file indicates that approximately 1.73 tons of absorbent material was used to cleanup this spill. Also, on October 21, 1994, approximately 3 gallons of fuel oil was spilled from an oil delivery truck and on April 30, 1986, approximately 5 gallons of diesel was spilled during an overfill of a storage tank. These spills were covered with absorbent and cleaned up by Commercial Disposal.

Groundwater samples were collected from five on-site and off-site groundwater wells as part of the 1994 report. The report also documents several sampling rounds that were conducted at the Site dating back to November 1989 (information obtained at the MADEP). Methyl tertiary-

butylether (MtBE) was detected in groundwater samples collected from well MW-3 at 3.2 microgram per liter ($\mu\text{g/L}$). Benzene and o-xylenes were detected in groundwater samples collected from well MW-2 at 3.3 $\mu\text{g/L}$ and 6.7 $\mu\text{g/L}$.

Chlorinated solvents including 1,1,1-trichloroethane were detected at concentrations ranging from below detection limits (BDL) to 725 microgram per liter ($\mu\text{g/L}$) (MW-4 - 11/3/89), trans-1,2-dichloroethylene ranged from BDL to 65 $\mu\text{g/L}$ (MW-5 - 11/3/89), trichloroethene (TCE) ranged from BDL to 58 $\mu\text{g/L}$ (MW-5 - 10/23/90), tetrachloroethene (PCE) ranged from BDL to 78 $\mu\text{g/L}$ (MW-5 - 11/3/89), 1,1-dichloroethane ranged from BDL to 34 $\mu\text{g/L}$ (MW-4 - 11/3/89) and 1,1-dichloroethylene ranged from BDL to 13 $\mu\text{g/L}$ (MW-4 - 11/3/89). A copy of the Environmental Site Assessment is provided as Appendix A. A summary of analytical results is presented as Table 1 within the 1994 Environmental Site Assessment Report.

3.1.2 - Environmental Site Assessment - August 2000

An *Environmental Site Assessment Report* was prepared by ECS in August of 2000. As part of the investigation, nine soil borings (EP-1 through EP-9) were advanced throughout the property (Figure 2). Soil samples collected from each soil boring were field screened for Total Organic Vapors (TOVs) via headspace method with the use of an HNu Model PI-101 Photoionization detector (PID) equipped with a 10.2 eV lamp (calibrated to an isobutylene standard and referenced to benzene). The method detection limit of the instrument is 0.1 ppm (ECS Protocols - Appendix B). A copy of the August 2000 Environmental Site Assessment Report is provided as Appendix A.

Borings EP-1 through EP-4 and EP-9 were advanced in the immediate vicinity of the 10,000-gallon diesel UST. Borings EP-5 through EP-7 were advanced in the vicinity of two 1,000-gallon USTs. Boring EP-8 was advanced in the vicinity of the oil/water separator.

As part of the investigation, selected soil samples were submitted for laboratory analysis for the presence of Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbon (EPH). VPH and EPH $\text{C}_5\text{-C}_8$ aliphatics, $\text{C}_9\text{-C}_{10}$ aromatics, $\text{C}_9\text{-C}_{18}$ aliphatics, $\text{C}_{11}\text{-C}_{22}$ aromatics were detected in the vicinity of the 10,000-gallon diesel UST at concentrations greater than Reportable Concentrations (RCs). EPH Targeted analytes naphthalene and 2-methylnaphthalene were also detected at concentrations above RCs. This condition required notification to the MADEP within 120-days of knowledge. A summary of laboratory analysis is presented in Table 1. Copies of Certificates of Laboratory Analysis are provided as Appendix C.

Groundwater samples were collected from five existing wells (MW-1 through MW-5) on July 24 and August 8, 2000, and analyzed for VPH, EPH and Volatile Organic Compounds (VOCs). VPH and EPH hydrocarbons ranges or target analytes were not detected above method detection limits. Tetrachloroethene (PCE) was detected in groundwater samples collected from wells MW-2 and MW-4 at a concentration of 1.4 $\mu\text{g/L}$, which is less than the RCs for groundwater category RCGW-2. No other VOCs were detected in any groundwater samples. A summary of laboratory analysis is presented in Table 2. Certificates of Laboratory Analysis are provided as Appendix C. This RAO addresses the release of diesel fuel from the 10,000-gallon UST. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

A Release Notification Form (RNF) was submitted to the MADEP in December of 2000 for the exceedances of RCs detected in soil samples collected from soil borings advanced in the vicinity of the former 10,000-gallon UST. A Notice of Responsibility (NOR) was issued by the MADEP on January 9, 2001, assigning RTN 1-13747.

3.2 IMMEDIATE RESPONSE ACTION PLAN – JANUARY 2001

On November 20, 2000, a tank tightness test of the 10,000-gallon diesel UST was performed by Tanknology. The results of the test indicated that there was a likelihood that a leak in the inner wall of a double wall UST existed at a rate equal to or greater than 0.05 gallons per hour. This condition required notification to the MADEP within 72-hours. On November 22, 2000, ECS notified the MADEP of a threat of a reportable release of diesel fuel. The MADEP subsequently assigned RTN 1-13697 to the Site. On December 8, 2000, an NOR was issued to Trailer Works, Incorporated. At the time of the notification, the MADEP approved the removal of the UST.

An IRA Plan was submitted to the MADEP on January 17, 2001. The IRA Plan proposed the removal and disposal of the 10,000-gallon UST and the excavation of up to 100 yards of petroleum impacted soil.

4.0 IMMEDIATE RESPONSE ACTIONS

4.1 UST REMOVAL ACTIVITIES

On April 23, 2001, tank removal activities were performed by Oil Recovery Corporation (Oil Recovery) of West Springfield, Massachusetts. Visual inspection of the tank indicated no evidence of holes, excessive corrosion of the metal. However, visual and olfactory evidence of soil contamination was observed in the vicinity of the soil borings advanced during the August 2000 Environmental Site Assessment. Contaminated soil was stockpiled on and over 6-mil polyvinyl sheeting.

During the period from April 24, 2001 to April 25, 2001, ECS and Oil Recovery proceeded with the removal of contaminated soil. Soil contamination was encountered approximately 10 feet below grade (fbg). This was determined by visual, olfactory and field screening. During excavation activities, discrete soil samples were collected from the sidewalls and base of the excavation and field screened using a Dextsil Petroflag Hydrocarbon Analyzer Kit (Petroflag®). The Petroflag® uses a system of extraction solvents, analytical reagents and a portable, battery powered spectrometer to determine Total Petroleum Hydrocarbons (TPH) contamination levels in soils. A methanol extraction solvent is mixed with 10 grams of soil to remove the hydrocarbons from the soil sample. The solvent and suspended materials are then filtered from the extract through a syringe to prevent interference. The sample is then added into a 6-ml vial containing a color developing reagent and the soil extract produces a response in proportion to the amount of hydrocarbon contained in the soil sample. The sample is then placed in a portable spectrometer, which reports the TPH concentration of the sample in ppm.

Soil samples collected from the excavation, which exhibited a Petroflag concentration greater than 500 ppm, were excavated. Based on field observation approximately 250 cubic yards of contaminated soil was excavated from the Site and transported off-site for recycling at Theodore Ondricks Company, LLC under a Bill of Lading (BOL). The actual tonnage excavated from the Site totaled 428.28 tons. A copy of the BOL is provided as Appendix D.

The MADEP approved the removal of 100 cubic yards of contaminated soil. Therefore, ECS verbally notified the MADEP when it was evident that the 100 cubic yard limit would be exceeded. MADEP subsequently approved the excavation of up to 250 yards of contaminated soil.

The final excavated measured approximately 80 feet long by 40 feet wide and encompassed former boring locations where EPH was detected. To adequately evaluate residual contaminant levels within the tank grave, 13 post excavation soil samples were submitted for laboratory analysis. Eight sidewalls samples collected from 8 to 15 feet and five base samples collected from the base at a depth of 16-17 fbg were submitted for laboratory analysis. Post excavation soil samples S-1, S-3, S-13, S-17, S-20, S-23, S-24, S-25, S-27, S-31, S-32, S-37 and S-40 were collected and submitted to Spectrum Analytical for VPH and EPH analysis. One soil sample (S-40) was also submitted for analysis of VOCs using United State Environmental Protection Agency (USEPA) Method 8260B, due the presence of VOCs detected in a sample from monitoring well MW-2.

4.2 GROUNDWATER SAMPLING

On May 9, 2001, representative groundwater samples were collected from monitoring wells MW-2 and MW-3 following ECS standard operating procedures. Groundwater sampling was attempted in three other wells MW-1, MW-4 and MW-5, however, these wells could not be located. Several attempts (i.e. metal detectors) to locate these wells was conducted as part this investigation. Each monitoring well

was gauged for depth to water and total well depth using an electronic water level indicator. Each well was then purged of three to five well volumes of groundwater or until the well was dry using low flow sampling protocols. Groundwater Sampling Logs are provided at Appendix E. Groundwater samples from each monitoring well were analyzed for VPH, EPH and VOCs.

All groundwater samples collected for laboratory analysis were preserved and handled per method-specific criteria, and submitted under chain-of-custody (COC) to Spectrum Analytical, a Massachusetts-certified analytical laboratory. Documentation of sample handling is provided on COC contained in Appendix C, Certificates of Laboratory Analysis.

4.3 DATA POINT SURVEY

For the purpose of determining groundwater flow direction at the Site, monitoring well MW-1 was reinstalled on November 12, 2001, using a hollow stem auger drilling rig. A survey of Site features and monitoring wells was conducted on November 15, 2000 by representatives of ECS. Additionally, the polyvinyl chloride (PVC) and protective casing of each monitoring well were surveyed for vertical location (elevation), referenced to a benchmark of 100 feet. All horizontal locations were rounded to the nearest 1-foot and all vertical locations were rounded to the nearest 0.01-foot. Data generated during ECS's property survey combined with water level measurements collected on September 4, 2001, were used to prepare the Site Plan and Water Table Contour Map (Figure 3).

4.4 IRA COMPLETION STATEMENT

Based on the results of this investigation, it is the opinion of ECS that no Imminent Hazards to health, safety, public welfare and the environment exist at the Site. All stockpiled remediation waste generated as a result of this IRA has been removed from the Site pursuant to 310 CMR 40.0030. It is the opinion of ECS that the IRA has been completed in accordance with 310 CMR 40.0410.

5.0 SITE GEOLOGY AND HYDROGEOLOGY

5.1 GEOLOGY

5.1.1 - Soils

The soil survey for Hampden County indicates the Site vicinity is comprised of "Hinckley-Windsor" association. In a typical profile of Hinckley, the surface layer is dark grayish brown loamy sand about 3 inches thick. The subsoil is loose yellowish brown loamy sand about 12 inches thick. The substratum is loose, light brown stratified sand and gravel to a depth of 60 inches or more. Permeability of Hinckley soil is rapid in the subsoil and very rapid in the substratum. The available water capacity is very low.

A typical profile of the Windsor soils, the surface layer is very friable, brown loamy sand about 7 inches thick. The subsoil is loose, single grained, strong brown coarse sand and loamy sand 16 inches thick. The substratum, is loose, single grained, yellowish brown sand to a depth of 60 inches.

IRA activities revealed that the subsurface soil consisted of very fine to fine sand to the maximum depth of 20 fbg.

5.1.2 - Bedrock Geology

According to the United States Geological Survey (USGS) bedrock beneath the Site consist of the Portland Formation of the Lower Jurassic Period. This formation consists of reddish-brown to pale red arkose and siltstone and gray sandstone, siltstone, and black shale interpreted as lake bed deposits (USGS, 1983). Bedrock was not encountered during excavation activities.

5.2 HYDROGEOLOGY

5.2.1 - Surface Water

No natural ponds, streams or other surface water exists on the Site. The closest surface water body is the Connecticut River, which is situated 500 feet to the northeast/east. A stormwater detention basin abuts the Site to the north which is owned and operated by the Town of West Springfield. This basin is primarily utilized during period of a prolonged rain event.

5.2.2 - Depth to Groundwater

Depth to groundwater in all wells on the Site was gauged on September 4, 2001. The average depth to groundwater on the Site based on the September 4, 2001 gauging is 18.89 fbg, as measured from the top of the PVC riser. Depth to groundwater ranged from 18.05 fbg in well MW-2 (located to the northeast of the excavation area on property owned by the City) to 19.69 fbg in well MW-3 (located in the southeastern portion of the Site).

5.2.3 - Groundwater Flow Direction

Groundwater flow beneath the Site was determined based on potentiometric surface elevations measured on September 4, 2001. Groundwater flow as interpreted from data collected on this date is towards the northeast (Figure 3).

6.0 ENVIRONMENTAL FATE & TRANSPORT OF PETROLEUM

6.1 PHYSICAL AND CHEMICAL CHARACTERISTICS OF PETROLEUM

The oil/hazardous material (OHM) of concern has been identified as fuel oil, which was released by the UST system formerly located in the northern portion of the Site.

6.1.1 - Diesel Fuel

Diesel fuel is a mixture of hydrocarbons derived through the processing of petroleum. The color, chemical composition, and thus specific physiochemical characteristics can vary depending on the time of year and location of the refining process. Diesel fuel has a specific gravity of approximately 0.77 to 0.84, and therefore, tends to float on the top of the water table. The overall solubility of heating oil in water is very low. The flash point of diesel fuel is 163 to 357 ° C. (MADEP Interim Final Petroleum Report-1994)

Diesel fuel is comprised of a complex mixture of aliphatics and aromatic hydrocarbons in the C₉ to C₂₀ range. The aromatic hydrocarbons, which typically account for 35 percent, are dominated by alkenes. Aliphatic compounds typically account for 64 percent of a diesel fuel product volume. (MADEP Interim Final Petroleum Report-1994.)

6.1.2 - Perchloroethylene

Perchloroethylene is a non-flammable, colorless liquid, that is commonly used in dry cleaning as a solvent. The molecular formula for PCE, which is classified as a halogenated aliphatic hydrocarbon, is C₂Cl₄. PCE has a specific gravity greater than 1, and therefore, tends to sink in water. The overall solubility of PCE in water is very low (<1 milligrams per liter (mg/L)).

PCE is highly volatile (vapor pressure 18.47 mm Hg) and its vapor has a vapor density of 5.7, resulting in a tendency for PCE vapors to sink in air or soil gas. The Henry's Law Constant for PCE is 1.8×10^{-2} atm m³/mol. The Henry's Law Constant is a relative measure of a compound's potential to partition between aqueous phase and gaseous phase. In other words, the Henry's Law Constant is an indicator of a compound's ability to move between a dissolved state in water to a gaseous state in the atmosphere until equilibrium is achieved. This constant is defined by the vapor pressure and the water solubility of the compound, temperature, as well as the proximal concentration of the compound in the atmosphere. In relative terms, those compounds with higher Henry's Law Constants will have a greater affinity to partition from an aqueous phase into the gaseous phase.

6.2 ENVIRONMENTAL FATE AND TRANSPORT OF PETROLEUM

Upon release to the subsurface heating oil will travel vertically through the vadose zone as non-aqueous phase liquid (NAPL). The rate of vertical migration is dependent largely on the permeability of the substrate and is highly influenced by stratigraphic variations. When the NAPL reaches the groundwater table, it tends to spread laterally, as petroleum is less dense than water. Once the NAPL comes in contact with the groundwater table, dissolution of the more soluble components of the bulk product occurs. Migration of the soluble fraction is dependent on the velocity of groundwater as well as natural attenuation processes.

Portions of the released product will remain adsorbed to the subsurface soils through which it passes. The percentage of release, which remains in the vadose zone, is related to the moisture content, surface charge density, soil particle size and compaction, and the organic content of soils. The adsorbed-phase is essentially immobile, yet represents a significant continuing source of potential groundwater impact via seasonal fluctuations of the water table elevation or infiltration. The adsorbed-phase may also exist below mid to high-level water table elevations due to migration of petroleum along the water table surface during low groundwater elevations.

Generally, the lower molecular weight components are those that occur in the dissolved- or vapor-phases. Thus, the dissolved-phase occurring in groundwater and the vapor-phase occurring in the vadose zone represent a lower molecular weight fraction of the original chemical composition of the petroleum. The more volatile components of the released product will migrate via gaseous diffusion. The migration of vapors is dependent on both pressure and concentration gradients.

Petroleum hydrocarbons consist of many organic compounds, each with its own physical and chemical characteristics. Each of these individual constituents will adsorb to the soil matrix, volatilize into the soil vapor, and dissolve into the groundwater at various rates governed by these characteristics. These compounds are subject to biological and chemical mechanisms that influence their fate and transport in the subsurface. For this reason, petroleum hydrocarbons are characterized as reactive solutes, and thereby are subjected to attenuation processes (e.g., dispersion, sorption, volatilization, biodegradation and hydrolysis) as they are transported in a groundwater regime. Such attenuation processes partition the parent product into the chemicals of concern previously identified. The net result of these attenuation mechanisms is a reduction in the velocity and ultimate transport distance of the solute when compared to groundwater.

Several specific properties of petroleum are important for understanding the fate and transport of each compound identified in soil and groundwater. The following section describes some of the more important physiochemical properties. Appendix F provides information about each petroleum constituent identified at the Site.

Vapor Pressure is defined as the pressure exerted by a vapor that is in equilibrium with its aqueous phase. The vapor pressure of an individual hydrocarbon compound is an indicator of the likelihood for the compound to volatilize. Compounds with higher vapor pressures will volatilize more readily than those compounds with lower vapor pressures.

The solubility of an individual hydrocarbon compound is an indicator of the potential mobility of an organic compound in the dissolved-phase. Upon reaching the groundwater table, compounds with higher solubilities will exhibit a relative increased mobility when compared to compounds that exhibit lower solubilities.

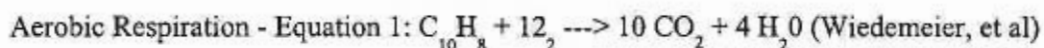
The Henry's Law Constant is a relative measure of a compound's potential to partition between aqueous phase and gaseous phase. In other words, the Henry's Law Constant is an indicator of a compound's ability to move between a dissolved state in water to a gaseous state in the atmosphere until equilibrium is achieved. This constant is defined by the vapor pressure and the water solubility of the compound, temperature, as well as the proximal concentration of the compound in the atmosphere. In relative terms, those compounds with higher Henry's Law Constants will have a greater affinity to partition from an aqueous phase into the gaseous phase.

The organic carbon partition coefficient (K_{oc}) represents a measure of the potential for a solute to disassociate from water and sorb to naturally occurring carbon (organic matter). Sorption onto naturally

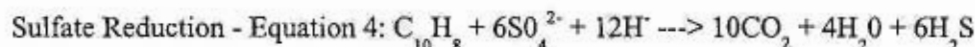
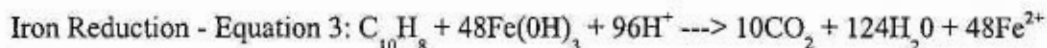
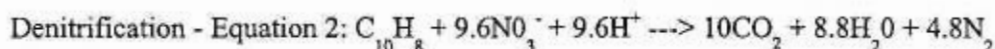
occurring organic matter represents only one of the chemical and physical properties that can result in sorption of a solute onto the soil matrix. The degree of sorption to organic matter is directly controlled by the quantity of naturally occurring organic matter in the environment and the solutes affinity to adsorb to carbon (distribution coefficient). Compounds with higher Koc values will exhibit a greater affinity to sorb to carbon in the aquifer matrix than those with lower Koc values. All other factors held constant, the greater the sorption potential of a specific compound the lower its potential mobility in the groundwater regime.

One of the more significant of the processes, with respect to the fate of most petroleum hydrocarbon compounds, is biodegradation. Aromatic hydrocarbons are degraded aerobically by microbes through a variety of metabolic pathways that utilize molecular oxygen to break the aromatic compounds into intermediate compounds which can eventually be fed into the Krebs cycle. The final end products of the Krebs cycle include energy, carbon dioxide, and water. (Baker-1994)

Aerobic respiration (as it relates to naphthalene) is represented by the following stoichiometric equation:



In areas where aerobic respiration has depleted an aquifer of oxygen, microbial populations will shift to populations that utilize nitrate, ferric iron hydroxide, and sulfate as electron acceptors. These processes (as they relate to naphthalene) are represented by the following stoichiometric equations, which are provided in the order of microbial preference:



In general, aliphatic hydrocarbons are easier to degrade than aromatic hydrocarbons. Straight chain aliphatic hydrocarbons in the range of C₁₀ through C₂₀ are readily degradable through aerobic degradation. However, degradation of aliphatic compounds with carbon chains of 9 carbon atoms or fewer, are more difficult to degrade.

Upon release to the subsurface, PCE will travel vertically through the vadose zone as non-aqueous phase liquid (NAPL). The rate of vertical migration is dependent largely on the permeability of the substrate and is highly influenced by stratigraphic variations. Referred to as light NAPL or LNAPL, the solvent will travel slowly through the capillary fringe of the groundwater table in the downgradient direction. The rate of horizontal LNAPL migration is influenced by the soil porosity, the organic content of soil, the volume of available pore space not occupied by groundwater. LNAPL gradually dissipates as it migrates, losing its mass to groundwater through dissolution, to soil gas through volatilization and to soil through adsorption.

When PCE NAPL encounters groundwater much of the NAPL continues to migrate through groundwater until it reaches a physical confining layer (soil or bedrock with an extremely low vertical hydraulic conductivity).

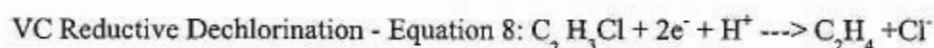
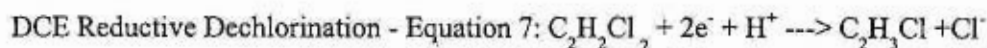
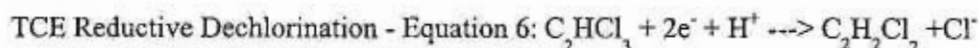
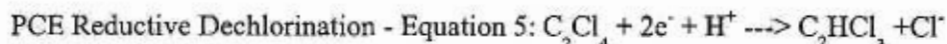
Portions of the released solvents will remain adsorbed to the subsurface soils through which they pass. The percentage of release, which remains in the vadose zone, is related to the moisture content, surface charge density, soil particle size and compaction, and the organic content of soils and the partitioning

characteristics the particular solvent. PCE has less of a tendency to sorb to soil and will migrate a further distance from the release location. The adsorbed-phase is essentially immobile, but it typically represents a significant continuing source of potential groundwater impact via seasonal fluctuations of the water table elevation or infiltration if it is not remediated. Dense non aqueous phase liquid (DNAPL), such as PCE, which can impact soil well below the top of the water table, this phenomenon is less significant for Stoddard Solvent.

The more volatile components of the released product will migrate via gaseous diffusion. The vapors of PCE are denser than air and tend to sink in soil gas. The migration of vapors is also dependent on both pressure and concentration gradients.

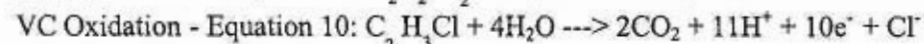
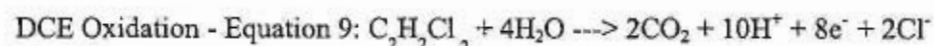
Once dissolved in groundwater, PCE are subjected to attenuation processes (e.g., dispersion, sorption, volatilization, biodegradation and hydrolysis) as they are transported in a groundwater regime. The net result of these attenuation mechanisms is a reduction in the velocity and ultimate transport distance of the solute when compared to groundwater.

The most important process for the natural attenuation of PCE is reductive dechlorination. During this process, the chlorinated hydrocarbon is used as an electron acceptor and a chlorine atom is removed and replaced with a hydrogen atom. Reductive dechlorination occurs in a sequential process degrading PCE to trichloroethylene (TCE), to dichloroethylene (DCE) and eventually to vinyl chloride (VC). While all three isomers of DCE can be produced during the degradation of PCE, 1,1-DCE, which is the most toxic, is the least common. The stoichiometric equations representing the complete reductive halogenation of PCE are provided below:



It should be noted that the completeness and rate of the reductive dehalogenation processes are influenced by a variety of environmental factors including the presence of organic carbon and the reduction-oxidation state of the aquifer. PCE degradation rates are greatest under anaerobic, reductive conditions. Because the degradation of petroleum hydrocarbons creates these conditions, degradation of PCE is more rapid in aquifers that have been impacted by petroleum hydrocarbons.

The degradation products DCE and VC are also susceptible to biologically mediated reduction-oxidation reaction. The reactions include the iron reduction, denitrification, and aerobic respiration. In these reactions, the chlorinated aliphatic hydrocarbons are mineralized to chloride, and ethene. The stoichiometric equations representing these processes are provided below:



6.3 POTENTIAL MIGRATION PATHWAYS OF OHM

The following potential migration pathways for petroleum hydrocarbons were evaluated during this investigation: air (vapors), groundwater, surface water and sediment. Preferential migration pathways (such as more permeable subsurface strata and utility lines) can expedite the migration of both vapor-phase and dissolved-phase hydrocarbons.

Groundwater is likely to discharge into neighboring surface water bodies. Therefore, the migration of groundwater, impacted by dissolved-phase hydrocarbons, is considered a potential migration pathway. However, VPH and EPH were not detected in groundwater samples collected from monitoring wells MW-2 and MW-3. Chlorinated solvents have historically been detected in on-site and off-site wells. PCE, TCE, trans-1,2-dichloroethane, cis-1,2-dichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethane and 1,1-dichloroethene were detected in groundwater samples collected in all wells at concentration less than applicable RCs. PCE, TCE and cis-1,2-dichloroethene were detected in groundwater samples collected as part of this investigation below RCs. PCE was also detected in groundwater samples collected during the August 2000 assessment, from wells MW-2 and MW-4 at a concentration of 1.4 µg/L, which is less than the RCs for groundwater category RCGW-2. No other VOCs were detected in any groundwater samples.

The Site and the area in the vicinity of and downgradient from the Site are paved and/or covered with gravel. Residual petroleum impacted soil is located at depths between 8 to 20 fbg. Exposure to vapors emanating from soils and groundwater in the subsurface on the Site is expected to be negligible. As noted above, groundwater at and in the vicinity of the Site is greater than 15 fbg and therefore, the groundwater is not considered a source of vapors to subsurface structures or buildings.

Because no surface water body exists at the Site, there is no potential for either surface water or sediment to convey petroleum away from the Site. Because crops or edible plants are not grown on-site for human consumption, food-chain pathways are not considered a potential migration pathway.

7.0 NATURE AND EXTENT OF CONTAMINATION

A remediation and assessment program including excavation of contaminated soil, soil and groundwater sampling, and analysis was conducted to collect data for characterization of the nature and extent of petroleum contamination at the Site.

Locations of all post excavation samples are shown on Figure 3. Soil sample screening data for Petroflag results are included in Table 3. Laboratory analytical results are summarized in Table 4 and 5.

7.1 SOIL AND GROUNDWATER BACKGROUND CONCENTRATIONS

According to the MCP [310 CMR 40.0006 (12)] background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are either:

- (a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and attributable to geologic or ecological conditions, or atmospheric deposition of industrial process or engine emissions;
- (b) attributable to coal ash or wood ash associated with fill material;
- (c) releases to groundwater from a public water supply system; or
- (d) petroleum residues that are incidental to the normal operation of motor vehicles.

The Site is used as a truck and trailer service company. The Site was formerly used as an office, storage warehouse and service garage. Property activities have apparently resulted in the release of oil to the soil. These contaminants would not have existed in the absence of activities at the Site. Background levels for petroleum-derived contaminants are considered zero or not detectable.

7.2 HORIZONTAL AND VERTICAL EXTENT OF OHM

The source of petroleum impact to soil has been identified as the UST system formerly located in the northern portion of the property, which was removed in April of 2001. During removal activities approximately 428.28 tons of soil was excavated and transported off-site.

The extent of the release area was determined based on detected TPH concentrations in field screening and detected VPH and EPH concentrations in post excavation soil samples. VPH C₅-C₈ aliphatics, C₉-C₁₂ aliphatics and C₉-C₁₀ aromatics were detected in post excavation soil samples S-23 and S-32 at concentrations less than Method 1 Standards. VPH target analytes naphthalene and total xylenes were detected less than Method 1 Standards.

EPH C₉-C₁₈ aliphatics, C₁₉-C₃₆ aliphatics and C₁₁-C₂₂ aromatics were detected in soil sample S-32 at concentration below Method 1 Standards. Targeted EPH analytes naphthalene, 2-methylnaphthalene, fluorene, phenanthrene and pyrene were also detected in soil samples collected from S-23 and S-32 at concentration less than Method 1 Standards. No chlorinated solvents were detected in soil sample S-40.

Based on the aforementioned information, the extent of the contamination is interpreted to be limited to the volume of soil which was excavated during April 2001. Limited residual concentration is present in the immediate vicinity of the tank excavation.

EPH aliphatics and aromatics and targeted analytes were not detected in groundwater samples collected from wells MW-2 and MW-3.

Chlorinated solvents have historically been detected in on-site and off-site wells. PCE, TCE, trans-1,2-dichloroethane, cis-1,2-dichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethane and 1,1-dichloroethene were detected in groundwater samples collected in all wells at concentration less than applicable RCs. PCE, TCE and cis-1,2-dichloroethene were detected in groundwater samples collected as part of this investigation below RCs. PCE was also detected in groundwater samples collected during the August 2000 assessment, from wells MW-2 and MW-4 at a concentration of 1.4 microgram $\mu\text{g/L}$, which is less than the RCs for groundwater category RCGW-2. No other VOCs were detected in any groundwater samples.

Based on historical groundwater sampling data, contaminants were detected in all on-site and off-site wells. Elevated concentrations of chlorinated solvents were detected in groundwater samples collected from well MW-5 (this well could not be located during the August 2000 and this investigation). This well is located upgradient of the diesel release area. 1,1,1-trichloroethane and PCE were detected in groundwater samples collected from MW-3 in November of 1989, October 1990, April 1991 and August 1994. No chlorinated solvents were detected in groundwater samples collected from well MW-3 (August 2000 and May 2001) above the PQL.

8.0 SITE RISK CHARACTERIZATION

A characterization of the risk of harm to health, safety, public welfare and the environment has been performed to provide quantitative and qualitative information to evaluate the need for remedial actions to mitigate such risks. This risk characterization has been conducted in accordance with MCP Method 1 as described in 310 CMR 40.0970. Method 1 is applicable to the Site because assessment has determined that contamination is limited to soil and/or groundwater, contaminants are not known to bioaccumulate, and there are promulgated Method 1 standards for all contaminants of concern at the Site. The risk characterization is based on MA DEP policy "Guidance for Disposal Site Risk Characterization" (BWSC ORS-95-141, July 1995) and the MCP (310 CMR 40.0000).

The Site Risk Characterization consists in summary of a description of the Site, the contaminants of concern, potential receptors of the contaminants, and exposure points. EPCs of contaminants are compared to applicable Method 1 standards to determine whether significant risk exists and whether remediation is required.

8.1 CURRENT AND FORESEEABLE FUTURE SITE USES

Current and reasonably foreseeable uses of the Site must be addressed to evaluate exposures. The foreseeable period of time for the Site is defined as an unlimited period of time. The Site is currently utilized as a truck and trailer service facility. There are full and/or part-time employees located or assigned to work at the facility. Future potential uses and activities at the Site include commercial and residential development and construction of subsurface utilities associated with redevelopment.

8.2 IDENTIFICATION OF HUMAN RECEPTORS

Human receptors were identified with consideration to current and foreseeable activities and uses of the Site. The Site is currently utilized as a truck and trailer service company and the employees who work in the facility are considered potential receptors. Employees are characterized as adults, including women of child bearing age. Trespassers of the property may be considered potential receptors and can be characterized as the general public, including children and women of child bearing age.

In the event the facility was replaced with a residential structure, human receptors would include future life long residents, characterized as the general public (including children and women of child bearing age). Other potential human receptors considered are construction and service workers associated with the development of the property, site utilities and landscaping. Such workers could potentially be exposed to site soils and groundwater if excavation is involved.

Use of the Site groundwater for drinking purposes is not considered to be consistent with the current or foreseeable land use based on the following information:

- According the MADEP Site Scoring Map generated by the Mass GIS, and information obtained from the West Springfield Board of Health, there are no community surface or groundwater drinking supplies within a half-mile radius of the Site.
- Based upon information obtained from the West Springfield Board of Health, there are no private drinking water supplies within a half-mile radius of the Site.

- A municipal drinking water supply source is available within 500 feet of the Site and surrounding properties.
- The Site is not located within a PPA and/or IWPA.

8.3 IDENTIFICATION OF ENVIRONMENTAL RECEPTORS

The Site is situated in the Connecticut River Drainage Basin and is located within 500 feet of the Connecticut River. According to the Massachusetts Natural Heritage Atlas, 2000-2001 editions, there are no Estimated Habitats of Rare Wetlands Wildlife and Certified Vernal Pools within a 500-foot radius of the Site. Because there are no surface water bodies present at the Site, shellfish and other aquatic biota are not present.

8.4 IDENTIFICATION OF SOIL AND GROUNDWATER CATEGORIES

Soil and groundwater at the Site are categorized according to the risk characterization guidelines of the MCP, 310 CMR 40.0900, Procedures and Standards for the Characterization of the Risk of Harm to Health, Safety, Public Welfare, and the Environment. Applicable groundwater and soil categories were determined from 310 CMR 40.0930, Identification of Site Groundwater and Soil Categories.

8.4.1 - Groundwater Category

The categorization of groundwater for risk characterization is based on current and potential use of groundwater, location of structures on the Site, and depth to groundwater. According to the DEP BWSC MassGIS - Springfield North Quadrangle the Site is not located within the boundaries of a PPA, a DEP approved Zone II Area and/or a IWPA. The average depth to groundwater at the Site and downgradient of the Site is estimated to be greater than 15 fbg.

Groundwater at all disposal sites shall be considered a potential source of discharge to surface water and shall be categorized, at a minimum, as category GW-3. Groundwater is defined as Category GW-2 if it is located within 30 feet of an occupied structure, and the average annual depth to groundwater is greater than 15 feet. Category GW-2 groundwater is considered to be a potential source of vapors of oil and/or hazardous material to indoor air.

Due to the fact that groundwater is estimated to be at a depth greater than 15 fbg, the above criteria place the Site groundwater in Groundwater Category GW-3.

8.4.2 - Soil Category

Categorization of soil for risk characterization is based on the potential for exposure by adults and children. The Site is currently used as a truck and trailer service facility and there are no plans for further (re)development.

- **Frequency of Use:** The frequency of use for employees is considered high. The Site building is accessed frequently during the day due to the presence of employees working full time shifts. Children (15 years or younger) and trespassers are present at the Site only as infrequent visitors characterizing their frequency of use as low. The frequency of future residence would be considered high and construction workers, utility workers would be considered low.

- **Intensity of Use:** Intensity of use for employees is considered to be low because none of the activities that employee's may perform would access or disturb soil beneath the building or the asphalt parking area. The intensity of use by future residence, construction worker and utility work would be considered high because activities at the Site performed would likely access or disturb subsurface soils.
- **Accessibility:** The Site soil beneath the paved parking area is characterized as potentially accessible. It is assumed that the Site area will remain paved. In the future if the pavement is removed from this area soils at a depth of 3 to 15 fbg would be characterized as potentially accessible and soil at a depth of 0 to 3 fbg would be accessible.

The above criteria place the Site soils in Soil Categories S-3/GW-3.

To evaluate the potential for an Activity and Use Limitation (AUL) to be implemented at the Site, post excavation soil concentrations were also compared to the more stringent Soil MCP Method 1 Standards Category S-1/GW-3. In accordance to 310 CMR 40.1012(1) any disposal site or portion of the disposal site for which an RAO is based on MCP Method 1 or 2 Soil Standards and the EPCs of OHM materials exceed the S-1 Standards but meet applicable S-2 standards an AUL shall be implemented to achieve or maintain a level of No Significant Risk.

8.5 IDENTIFICATION OF EXPOSURE POINTS, PATHWAYS AND CONCENTRATIONS

Exposure points are defined as locations where potential contact between human or environmental receptors with a release petroleum occurs. Exposure pathways are the mechanism through which exposure would occur, such as inhalation or dermal absorption. The following pathways were identified based upon the identified and potential receptors and the site characteristics:

- Residents of a hypothetical residential development would come into direct contact with soils, and potentially consume soil and/or grow fruits and vegetables on the Site.
- Utility and/or construction workers of a hypothetical re-development would come into direct contact with soils.
- Connecticut River or other surface water body receives groundwater from the Site.

Because depth to groundwater at the Site is at a level greater than 15 fbg, humans occupying structures above the groundwater are not considered potential receptors for inhaling vapors which had partitioned from the groundwater and migrated into the building.

Exposure Point Concentrations (EPCs) for soil and groundwater were determined using the maximum concentrations of each individual analyte detected by laboratory analysis. Only samples which contained petroleum at concentrations exceeding the Practical Quantitation Limits (PQL) and collected from within the impacted areas were utilized for EPC calculation. EPCs in groundwater consist of the highest concentrations for each individual analyte detected in each well. EPCs are summarized in Tables 6 and 7.

8.6 CHARACTERIZING RISK

8.6.1 - Exposure Point Concentrations for Soil

EPCs for soil were compared to applicable Method 1 standards to evaluate risk at the Site. The EPCs for all compounds analyzed in soil samples are shown with the applicable Method 1 Soil Standards in Table 6. All EPCs are below the most stringent Method 1 Standards.

8.6.2 - Exposure Point Concentrations for Groundwater

All groundwater EPCs are below applicable Method 1 Standards (see Table 7). Concentrations of chlorinated solvents were detected in groundwater samples collected from well MW-1, MW-2, MW-3 MW-4 and MW-5 at concentrations less than RCs and Method 1 Standards. This RAO specifically addresses the release of diesel fuel from the 10,000-gallon UST. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

8.7 CHARACTERIZATION OF RISK TO SAFETY

The risk of harm to safety is evaluated according to the MCP requirements as specified in 310 CMR 40.0960. The conditions at the disposal site related to the contamination do not currently pose a threat of physical harm or bodily injury to people. There are no rusted or corroded drums or containers, open pits, lagoons, or other dangerous structures. There is no threat of fire or explosion. There are no uncontained corrosive, reactive, or flammable materials.

8.8 FEASIBILITY OF ACHIEVING OR APPROACHING BACKGROUND CONCENTRATIONS

Excavation and replacement of impacted soils have achieved a Permanent Solution in which the remaining concentrations of OHM at all soil sample points are either below laboratory method detection limits, or are below the Method 1 Standards for the Site. Therefore, the Site conditions (with respect to the OHM impact to soil) can be said to be approaching background concentrations. While it would be technically feasible for additional excavation and replacement of impacted soil to reduce residual concentrations to background, this excavation would require the remobilization, removal of the backfill material, excavation, off-site disposal and restoration of the Site. The cost to perform excavation is estimated to be approximately \$10,000.00. Considering that the conditions at the Wayside Avenue property does not constitute a Significant Risk, the incremental costs of conducting the additional remediation is substantial and disproportionate to the incremental benefit of risk reduction, environmental restoration monetary and non-pecuniary value.

9.0 CONCLUSIONS

On behalf of T Works, Inc., ECS has completed an IRA Completion and RAO Report for the property located at 115 Wayside Avenue in Chicopee, Massachusetts. The Site defined as the areas proximal to, and downgradient of the former 10,000-gallon diesel UST located in the northeastern portion of the property. This RAO was conducted to satisfy the requirements of Massachusetts General Laws (MGL) Chapter 21E and the MCP, 310 CMR 40.0000.

- The Site is owned by T Works, Inc., and is currently utilized as a as a truck and trailer service company.
- The 10,000-gallon diesel UST that was removed in April of 2001 is the likely source of petroleum at the Site.
- From the period of April 23, 2001 to April 25, 2001, IRA activities including the excavation of 428.28 tons of contaminated soil and collection of post excavation soil samples for field screening and laboratory analysis.
- Groundwater flow was estimated to be toward the northeast. The Site is not located within a PPA, IWPA and/or a DEP Zone II area. Average depth to groundwater at the Site and downgradient of the Site is estimated to be greater than 15 fbg.
- Post excavation soil samples were submitted for laboratory analysis of VPH and EPH. VPH C₅-C₈ aliphatics, C₉-C₁₂ aliphatics and C₉-C₁₀ aromatics were detected in post excavation soil samples S-23 and S-32 at concentrations less then Method 1 Standards. VPH target analytes naphthalene and total xylenes were detected at concentrations less than Method 1 Standards. EPH C₉-C₁₈ aliphatics, C₁₉-C₃₆ aliphatics and C₁₁-C₂₂ aromatics were detected in soil sample S-32 at concentration below Method 1 Standards. Targeted EPH analytes naphthalene, 2-methylnaphthalene, fluorene, phenanthrene and pyrene were also detected in soil samples collected from S-23 and S-32 at concentration less than Method 1 Standards.
- No EPH aliphatics and aromatics and targeted analytes were detected in groundwater samples collected from wells MW-2 and MW-3. Chlorinated solvents including PCE, TCE and cis-1,2-dichloroethene were detected in groundwater samples collected from well MW-2 at concentrations less than RCs.
- In order to evaluate whether a level of No Significant Risk exists for foreseeable Site activities and uses, the MCP Method 1 Soil Standards S-1/2/3/GW-3 were used for characterizing risk associated with OHM detected at the Site.
- Soil EPCs did not exceed applicable MCP Method 1 Soil Standards S-1/2/3/GW-3.
- Groundwater EPCs did not exceed applicable MCP Method 1 Groundwater Standards GW-3. Chlorinated solvents including 1,1,1-trichloroethane, PCE, TCE, trans-1,2-dichloroethene, cis-1,2-dichloroethene, 1,1-dichloroethane and 1,1-dichloroethene were detected in groundwater samples collected from alls wells at concentration less than RCs. In addition, the highest concentrations of chlorinated solvents were detected in groundwater samples collected from well

MW-5. This well could not be sampled during the August 2000 and this investigation due to the fact that the well could not be located. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

Based on the assessment and remedial activities conducted at the Site, it was determined that no further remedial response actions are needed at the Site to achieve a condition of No Significant Risk. The Site qualifies for a Class A-2 RAO based on the following:

- Response actions have been conducted at the Site in order to achieve a level of No Significant Risk;
- Concentrations of VPH detected at the Site meet applicable Method 1 Risk Characterization Standards and do not exceed the Upper Concentration Limit (UCL) in soil.
- Background concentrations have been achieved at the Site.
- This RAO ensures a level of control of each identified substance of concern at a Site or in the surrounding environment such that no such substance of concern shall present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time.
- No AUL is needed to maintain a level of No Significant Risk.

FIGURES

Figure - 1

NOTES:

Site plan prepared from plans obtained from City of West Springfield Offices. A plan by H.R.P. Associates, and a site visit by an ECS representative.

All locations, and dimensions of the site features, and property lines are approximate. This plan should not be used for construction or land conveyance purposes.

No area survey was performed, all locations are approximate.

Groundwater flow direction based on a plan by HRP Assoc. dated 1/31/91.

Locations of monitoring wells, and previously excavated area, based on a plan by HRP Assoc.

Legend

- Approximate Property Line
- X-X- Chainlink Fence
- ⊙ Monitoring Well
- MW-1 Monitoring Well I.D.
- Catchbasin
- Soil Boring
- ECS-1 Well I.D.



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115 Wayside Avenue
West Springfield, Massachusetts

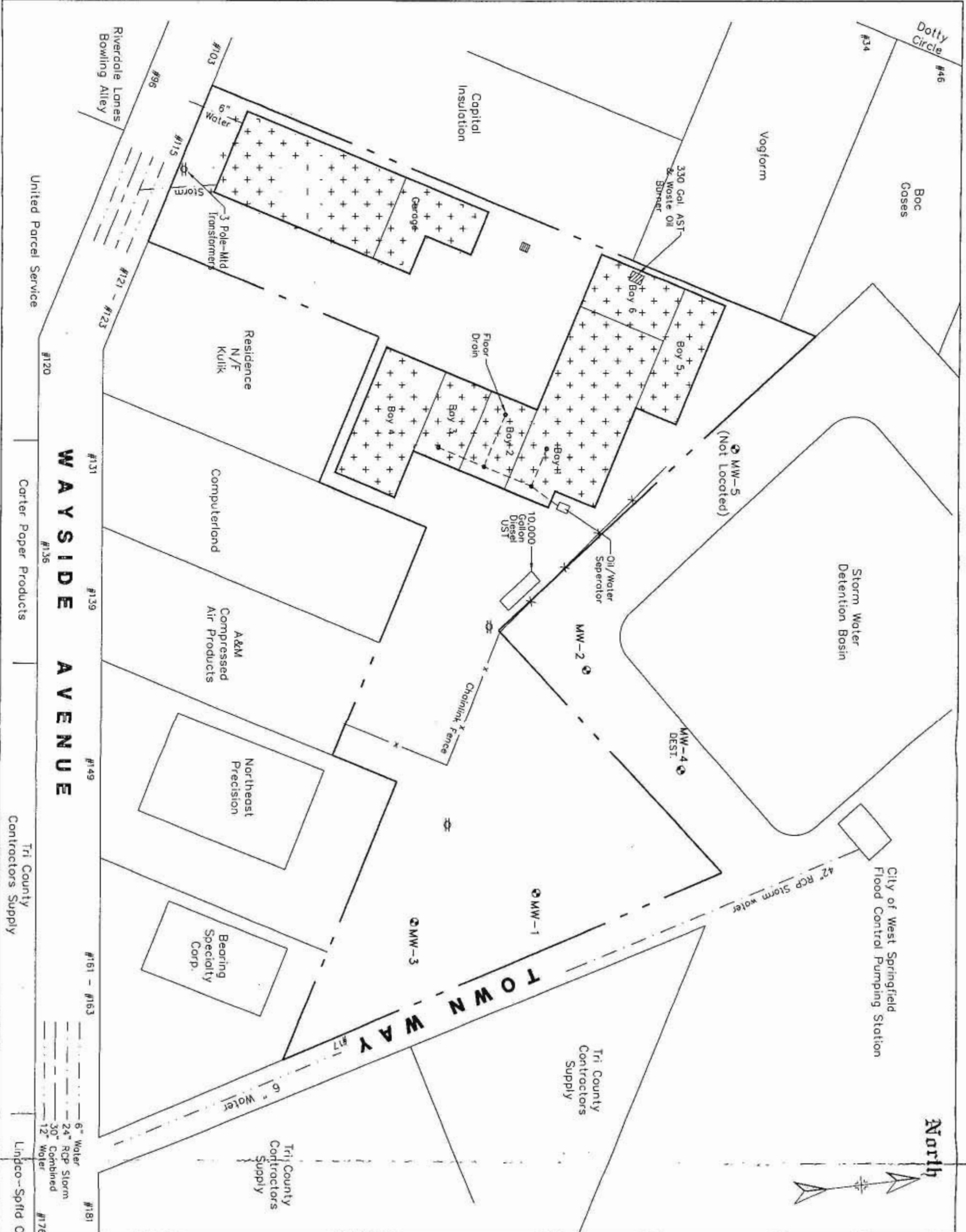
Site Plan

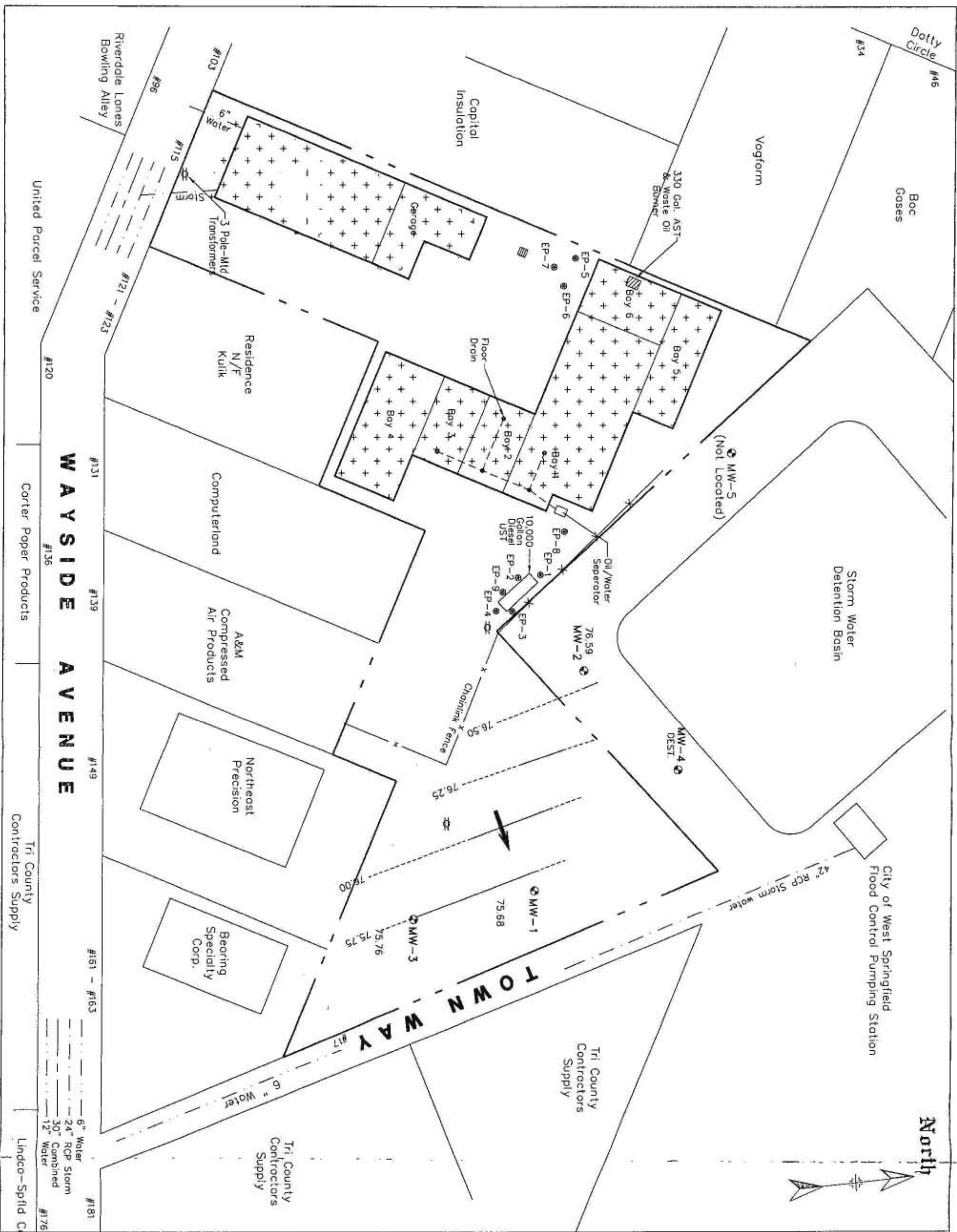
Robert Townsend

GRAPHIC SCALE: 0 30 60

COMPUTER CODE: S12142W.DWG
DRAWN BY: DESIGNED BY: CHECKED BY: APPROVED BY:

RAS	CP	CP	DM
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1" = 60'	Oct. 2001	13997	2





NOTES:

Site plan prepared from plans obtained from City of West Springfield Offices. A plan by H.R.P. Associates, and a site visit by an ECS representative. All locations, and dimensions of the site features, and property lines are approximate. This plan should not be used for construction or land conveyance purposes. No area survey was performed. Groundwater flow direction based on a plan by HRP Assoc. dated 1/31/91. Locations of monitoring wells, and previously excavated area, based on a plan by HRP Assoc.

- Legend**
- Approximate Property Line
 - X-X- Chainlink Fence
 - Monitoring Well
 - MW-1 Monitoring Well I.D.
 - Catchbasin
 - Soil Boring
 - ECS-1 Well I.D.

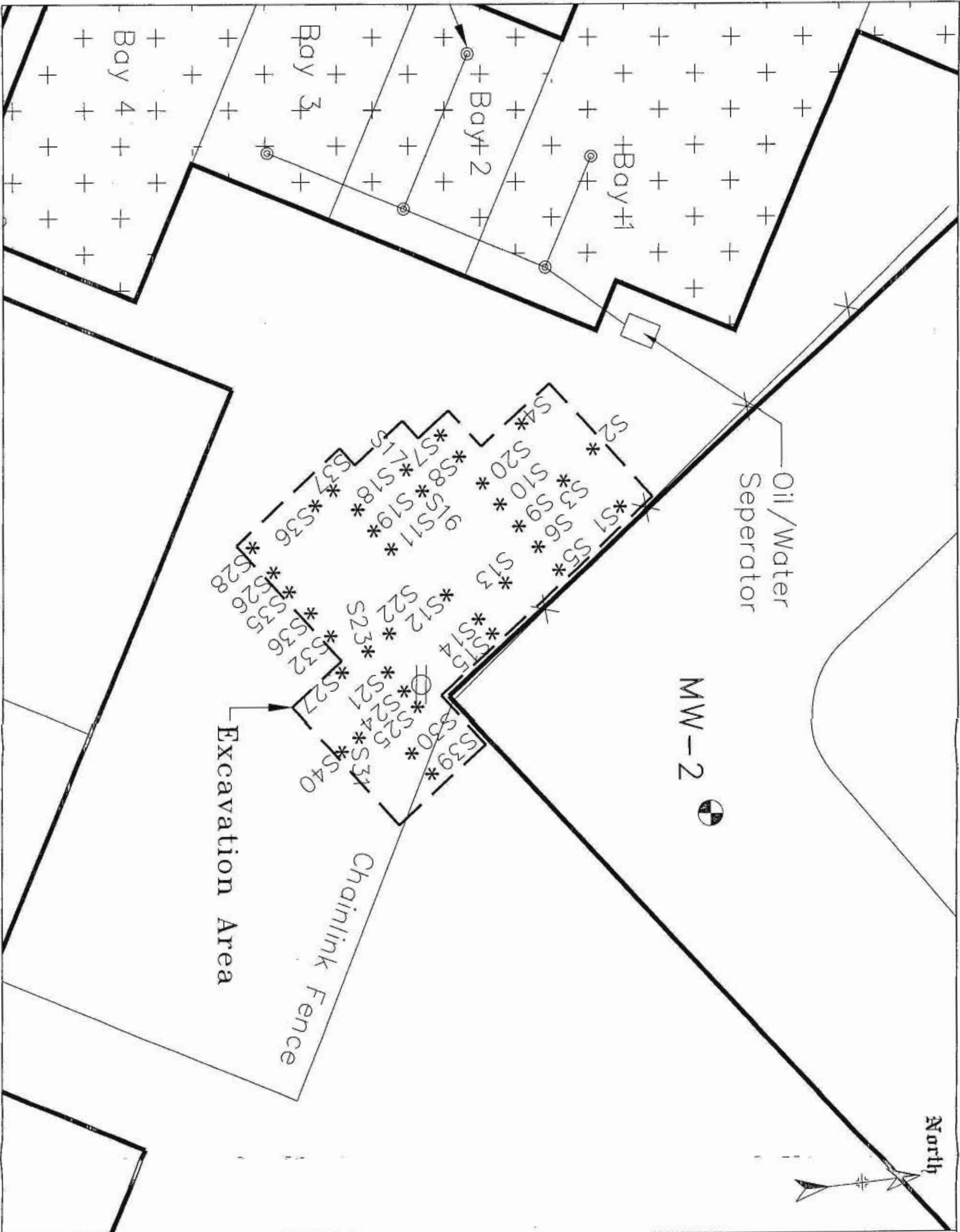


ENVIRONMENTAL COMPLIANCE SERVICES, INC.
588 Silver Street • Agawam, MA 01001

PROJECT:
T Works, Inc.
115 Wayside Avenue
West Springfield, Massachusetts

Site Plan with Groundwater Contours
Robert Townsend

GRAPHIC SCALE: 0 30 60			
Computer Contour: S1712W.DWG			
DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
RAS	CPP	CPP	DM
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1" = 60'	Oct. 2001	13997	3



NOTES:

Site plan prepared from plans obtained from City of West Springfield Offices. A plan by H.R.P. Associates, and a site visit by an ECS representative. All locations, and dimensions of the site features, and property lines are approximate. This plan should not be used for construction or land conveyance purposes. No area survey was performed. Oil locations are approximate. Groundwater flow direction based on a plan by HRP Assoc. dated 1/31/91. Locations of monitoring wells, and previously excavated area, based on a plan by HRP Assoc.

Legend

- Approximate Property Line
- Chainlink Fence
- Monitoring Well
- Monitoring Well I.D.
- Catchbasin
- Soil Boring
- Soil Sample

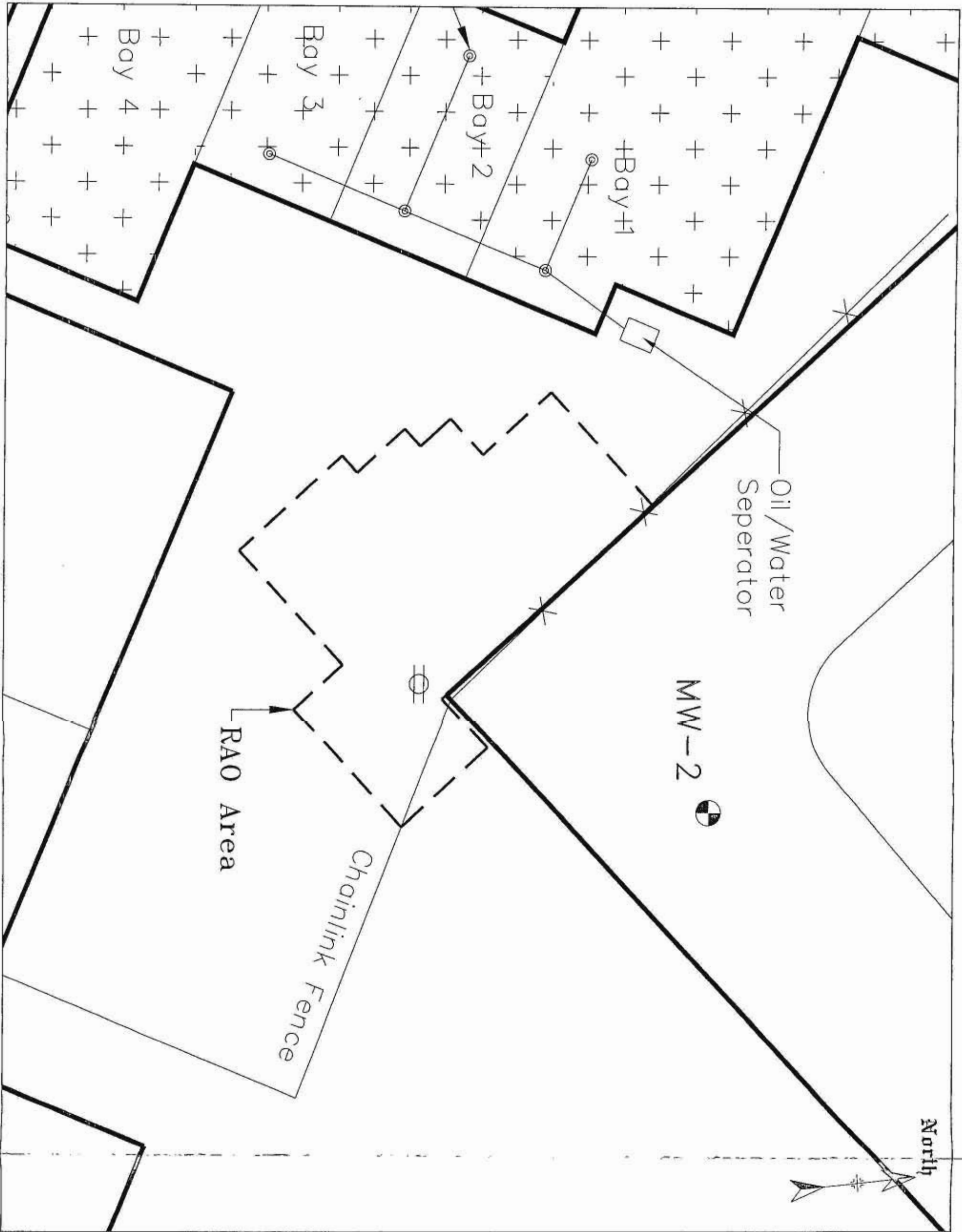


ENVIRONMENTAL COMPLIANCE SERVICES, INC.
588 Silver Street • Agawam, MA 01001
PROJECT: T Works, Inc.
115 Wayside Avenue
West Springfield, Massachusetts

Excavation Area & Sampling Locations

Robert Townsend

GRAPHIC SCALE: 20' 10' 0' 10' 20'			
COMPUTER DTP: S12142W.DWG			
DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
RAS	CPP	CPP	DM
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1" = 20'	Oct, 2001	13997	4



NOTES:

Site plan prepared from plans obtained from City of West Springfield Offices. A plan by H.R.P. Associates, and a site visit by an ECS representative. All locations, and dimensions of the site features, and property lines are approximate. This plan should not be used for construction or land conveyance purposes. No area survey was performed, oil locations are approximate. Groundwater flow direction based on a plan by HRP Assoc, dated 1/31/91. Locations of monitoring wells, and previously excavated area, based on a plan by HRP Assoc.

Legend

- Approximate Property Line
- X-X- Chainlink Fence
- ⊙ Monitoring Well
- MW-1 Monitoring Well I.D.
- Catchbasin
- ⊙ Soil Boring
- * Soil Sample



ENVIRONMENTAL COMPLIANCE SERVICES, INC.
588 Silver Street • Agawam, MA 01001

PROJECT:
T Works, Inc.
115 Wayside Avenue
West Springfield, Massachusetts

RAO Area

Robert Townsend

GRAPHIC SCALE:			
20	10	0	10 20
COMPUTER GRAPHIC SYSTEMS, INC.			
DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
RAS	CPP	CPP	DM
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1" = 20'	Oct, 2001	13997	5

TABLES

115 Wayside Avenue West Springfield, Massachusetts Job # 13997	Table 1 Concentrations of Volatile Petroleum Hydrocarbons (VPH), and Extractable Petroleum Hydrocarbons (EPH), in Soil Samples (Methods MADEP MADEP VPH 97-12 and MADEP EPH 98-1)				
	Sample Location	EP-9 12-14'	EP-2 6-8'	EP-4 2-4'	Reportable Concentrations ⁽²⁾
	Sampling Date	7/28/00	7/25/00	7/25/00	RCS-1
	VPH Aliphatics/Aromatics (mg/Kg) ⁽¹⁾				
	C5-C8 Aliphatics Hydrocarbons	36	108	ND/3.39	100
C9-C12 Aliphatics Hydrocarbons	39	386	26	1,000	
C9-C10 Aromatics Hydrocarbons	100	520	39	100	
VPH Target Analytes (ug/Kg) ⁽¹⁾					
Benzenes	ND/720	ND/800	ND/230	10,000	
Ethylbenzene	3,800	14,400	ND/230	80,000	
Methyl-tert-butyl ether	ND/720	ND/800	ND/230	300	
Naphthalene	7,600	48,000	4,900	4,000	
Toluene	ND/720	ND/800	ND/230	90,000	
m,p-Xylenes	10,600	41,600	ND/450	500,000 ⁽³⁾	
o-Xylenes	5,400	20,000	ND/230		
EPH Aliphatics/Aromatics (mg/Kg) ⁽¹⁾					
C9-C18 Aliphatics Hydrocarbons	ND/30	1,300	ND/30	1,000	
C19-C36 Aliphatics Hydrocarbons	ND/30	250	39	2,500	
C11-C22 Aromatics Hydrocarbons	ND/30	1,299	ND/30	200	
EPH Target PAH Analytes (ug/Kg) ⁽¹⁾					
Naphthalene	ND/150	27,000	ND/160	4,000	
2-Methylnaphthalene	ND/150	37,000	ND/160	4,000	
Acenaphthylene	ND/150	380	ND/160	100,000	
Acenaphthene	ND/150	370	ND/160	20,000	
Fluorene	ND/150	800	ND/160	400,000	
Phenanthrene	ND/150	2,000	ND/160	100,000	
All Other Compounds	ND	ND	ND	N/A	
NOTES: ND = Not detected at concentrations greater than PQL					
N/A= Not applicable.					
¹ Milligrams per kilogram (mg/Kg) or micrograms per kilogram (ug/Kg) as noted.					
² MCP Reportable Concentrations (RCs) pursuant to 310 CMR 40.1600					
³ Reportable concentrations for Total Xylenes.					
Bold and Shaded = concentrations above reportable concentrations					

115 Wayside Avenue West Springfield, Massachusetts Job # 13997	Table 2 Concentrations of Volatile Organic Compounds (VOC), Volatile Petroleum Hydrocarbons (VPH), and Extractable Petroleum Hydrocarbons (EPH) in Groundwater Samples (Methods EPA 601, MADEP VPH 97-12, MADEP EPH 98-1)					
	Sample Location	MW-1	MW-2	MW-3	MW-4	Reportable Concentrations ⁽²⁾
	Sampling Date	7/24/00 and 8/8/00	7/24/00 and 8/8/00	7/24/00 and 8/8/00	7/24/00 and 8/8/00	RCGW-2
	Volatile Organic Compounds (µg/L)					
cis-1,2-dichloroethene	BDL/1	BDL/1	BDL/1	BDL/1	30,000	
Tetrachloroethene	BDL/1	1.4	BDL/1	1.4	3,000	
Trichloroethene	BDL/1	BDL/1	BDL/1	BDL/1	300	
Volatile Petroleum Hydrocarbons (mg/l) ⁽¹⁾						
C5-C8 Aliphatics	BDL/0.075	BDL/0.075	BDL/0.075	BDL/0.075	1	
C9-C12 Aliphatics	BDL/0.025	BDL/0.025	BDL/0.025	BDL/0.025	1	
C9-C10 Aromatics	BDL/0.025	BDL/0.025	BDL/0.025	BDL/0.025	4	
Volatile Petroleum Hydrocarbons Analytes (µg/L) ⁽¹⁾						
Benzene	BDL/5	BDL/5	BDL/5	BDL/5	2,000	
Ethylbenzene	BDL/5	BDL/5	BDL/5	BDL/5	4,000	
Methyl-tert-butyl ether	BDL/5	BDL/5	BDL/5	BDL/5	50,000	
Naphthalene	BDL/5	BDL/5	BDL/5	BDL/5	6,000	
Toluene	BDL/5	BDL/5	BDL/5	BDL/5	6,000	
m,p-Xylenes	BDL/10	BDL/10	BDL/10	BDL/10	6,000 ⁽³⁾	
o-Xylenes	BDL/5	BDL/5	BDL/5	BDL/5		
Extractable Petroleum Hydrocarbons (mg/l) ⁽¹⁾						
C9-C18 Aliphatics	BDL/0.2	BDL/0.2	BDL/0.2	BDL/0.2	1	
C19-C36 Aliphatics	BDL/0.2	BDL/0.2	BDL/0.2	BDL/0.2	20	
C11-C22 Aromatics	BDL/0.2	BDL/0.2	BDL/0.2	BDL/0.2	30	
Polycyclic Aromatic Hydrocarbons (µg/l) ⁽¹⁾						
Naphthalene	BDL/5	BDL/5	BDL/5	BDL/5	6,000	
2-Methylnaphthalene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Acenaphthene	BDL/5	BDL/5	BDL/5	BDL/5	5,000	
Acenaphthylene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Fluorene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Phenanthrene	BDL/5	BDL/5	BDL/5	BDL/5	50	
Anthracene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Fluoranthene	BDL/5	BDL/5	BDL/5	BDL/5	200	
Pyrene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Benzo(a)anthracene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Chrysene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Benzo(b)fluoranthene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Benzo(k)fluoranthene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Benzo(a)pyrene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Indeno(1,2,3-cd)pyrene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Dibenzo(a,h)anthracene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	
Benzo(g,h,i)perylene	BDL/5	BDL/5	BDL/5	BDL/5	3,000	

NOTES: BDL = Not detected at the practical quantitation limit.
N/A= Not Applicable.
¹ Milligrams per liter (mg/L) or micrograms per liter (µg/L) as noted.
² MCP Reportable Concentrations (RCs) pursuant to 310 CMR 40.1600
³ Reportable concentrations for Total Xylenes.
Bold and Shaded = concentrations above reportable concentrations.

Table 3
TPH Results from Post Excavation Soil Samples
115 Wayside Avenue
West Springfield, Massachusetts
Job # 13997

Sample I.D.	Petroflag (ppm)
S-1	53*
S-2	47
S-3	34*
S-4	5
S-5	42
S-6	167**
S-7	254**
S-8	161**
S-9	1738**
S-10	EEEE**
S-11	208**
S-12	46
S-13	98*
S-14	85
S-15	74
S-16	120
S-17	122*
S-18	181
S-19	EEEE**
S-20	311*
S-21	2089**
S-22	263
S-23	294*
S-24	142*
S-25	1798(*)**
S-26	EEEE**
S-27	149*
S-28	EEEE**
S-29	336
S-30	339
S-31	30*
S-32	271*
S-33	23
S-34	19
S-35	48
S-36	39
S-37	56*
S-38	29
S-39	25
S-40	41*

Notes: EEEE = Greater than 2,000 ppm
 * Samples submitted for laboratory analysis.
 ** Soils excavated

115Wayside Avenue
West Springfield, Massachusetts
Job # 13997

Table 4
Concentration of Volatile Petroleum Hydrocarbons (VPH)
Extractable Petroleum Hydrocarbons (EPH)
for Soil
(Method NADAP VPH 97-12 and NADAP EPH 96-1)

Sample Location	S-1	S-3	S-13	S-17	S-20	S-23	S-24	S-25*	S-27	S-31	S-32	S-37	S-40	Method 1 Standards		
Sampling Date	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/25/01	4/25/01	4/25/01	4/25/01	S-107W-3	S-207W-3	S-307W-3
Volatiles Petroleum Hydrocarbons (mg/kg) ¹																
C3-C8 Aliphatics	BDL/0.810	BDL/1.22	BDL/0.810	BDL/1.22	BDL/0.960	3.7	BDL/0.690	13	BDL/1.05	BDL/0.675	5.9	BDL/0.915	BDL/1.05	100	200	500
C9-C12 Aliphatics	BDL/0.270	BDL/0.405	BDL/0.270	BDL/0.405	BDL/0.330	3.8	BDL/0.230	70	BDL/0.330	BDL/0.225	14	BDL/0.305	BDL/0.330	1,000	2,500	5,000
C9-C10 Aromatics	BDL/0.270	BDL/0.405	BDL/0.270	BDL/0.425	BDL/0.330	3.9	BDL/0.230	103	BDL/0.330	BDL/0.225	18	BDL/0.305	BDL/0.330	300	500	500
Volatile Petroleum Hydrocarbons Analytes (ug/kg) ¹¹																
Benzene	BDL/54	BDL/81	BDL/54	BDL/85	BDL/64	BDL/51	BDL/46	BDL/280	BDL/70	BDL/45	BDL/230	BDL/61	BDL/70	40,000	80,000	200,000
Ethylbenzene	BDL/54	BDL/81	BDL/54	BDL/85	BDL/64	BDL/51	BDL/46	2,200	BDL/70	BDL/45	BDL/230	BDL/61	BDL/70	500,000	100,000	100,000
Methyl-tert-butyl Ether	BDL/54	BDL/81	BDL/54	BDL/85	BDL/64	BDL/51	BDL/46	BDL/280	BDL/70	BDL/45	BDL/230	BDL/61	BDL/70	100,000	200,000	200,000
Napthalene	BDL/54	BDL/81	BDL/54	BDL/85	BDL/64	BDL/51	BDL/46	3,600	BDL/70	BDL/45	BDL/230	BDL/61	BDL/70	100,000	100,000	1,000,000
Toluene	BDL/54	BDL/81	BDL/54	BDL/85	BDL/64	BDL/51	BDL/46	BDL/280	BDL/70	BDL/45	BDL/230	BDL/61	BDL/70	500,000	100,000	2,500,000
m,p-Xylenes	BDL/54	BDL/81	BDL/54	BDL/170	BDL/130	BDL/100	BDL/96	10,200	BDL/140	BDL/90	1,800	BDL/120	BDL/140	500,000	100,000	2,500,000
o-Xylenes	BDL/54	BDL/81	BDL/54	BDL/85	BDL/64	BDL/51	BDL/46	1,400	BDL/70	BDL/45	880	BDL/61	BDL/70	500,000	100,000	2,500,000
Extractable Petroleum Hydrocarbons (mg/kg) ¹¹																
C9-C18 Aliphatics	BDL/20	BDL/36	BDL/26	BDL/40	BDL/40	BDL/40	BDL/30	200	BDL/20	BDL/20	81	BDL/20	BDL/20	1,000	2,500	5,000
C19-C26 Aliphatics	BDL/20	BDL/36	BDL/26	BDL/40	BDL/40	BDL/40	BDL/30	200	BDL/20	BDL/20	32	BDL/20	BDL/20	2,500	5,000	5,000
C11-C22 Aromatics	BDL/20	BDL/36	BDL/26	BDL/40	BDL/40	BDL/40	BDL/30	272	BDL/20	BDL/20	104	BDL/20	BDL/20	800	2,000	5,000
Polynuclear Aromatic Hydrocarbons (ug/kg) ¹¹																
Naphthalene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	8,200	BDL/170	BDL/140	720	BDL/170	BDL/170	100,000	1,000,000	1,000,000
2-Methyl-naphthalene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	2,200	BDL/170	BDL/170	500,000	1,000,000	1,000,000
Acenaphthene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	1,000,000	2,500,000	4,000,000
Acenaphthylene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	100,000	1,000,000	1,000,000
Fluorene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	100,000	1,000,000	4,000,000
Phenanthrene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	250	BDL/170	BDL/140	280	BDL/170	BDL/170	100,000	1,000,000	100,000
Anthracene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	1,000,000	2,500,000	5,000,000
Fluoranthene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	330	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	1,000,000	1,000,000	70,000
Pyrene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	330	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700,000	2,000,000	5,000,000
Benzo[a]anthracene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700	1,000	4,000
Chrysene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700	1,000	4,000
Benzo[b]fluoranthene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700	1,000	4,000
Dibenz[a,h]anthracene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700	1,000	4,000
Benzo[k]fluoranthene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700	1,000	4,000
Indeno[1,2,3-cd]pyrene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700	1,000	4,000
Dibenz[a,h]anthracene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	700	1,000	4,000
Benzo[a]pyrene	BDL/140	BDL/170	BDL/140	BDL/180	BDL/180	BDL/190	BDL/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDL/170	1,000,000	2,000,000	2,500,000

NOTES: BDL = Below practical quantitation limits.
NA = Not Analyzed For.
NS = No Standard.
¹Milligrams per kilogram (mg/kg) or micrograms per kilogram (ug/kg) as noted.
¹¹NIJ Method 1 Soil Standards from Table 2, 310 CMR 40.0975 (6)(a).
*Standard for Total PCBs.
*Area was extracted.
*Area was extracted.
*Area was extracted.

115 Wayside Avenue West Springfield, Massachusetts Job # 13997	Table 5 Concentrations of Volatile Organic Compounds (VOCs) Volatile Petroleum Hydrocarbons (VPH) Extractable Petroleum Hydrocarbons (EPH) for Groundwater Samples (Methods EPA 8260B, MADEP VPH 97-12 and MADEP EPH 98-1)				
	Sample Location	MW-2	MW-3	Reportable Concentrations ⁽²⁾	Method 1 Standards ⁽³⁾
	Sampling Date	5/9/01	5/9/01	RCGW-2	GW-3
	Volatile Organic Compounds (µg/L) ⁽¹⁾				
	cis-1,2-dichloroethene	9.2	BDL/1	30,000	50,000
Tetrachloroethene	10	BDL/1	3,000	5,000	
Trichloroethene	3.1	BDL/1	300	20,000	
Volatile Petroleum Hydrocarbons (mg/L) ⁽¹⁾					
C5-C8 Aliphatics	BDL/0.075	BDL/0.075	1	4	
C9-C12 Aliphatics	BDL/0.025	BDL/0.025	1	20	
C9-C10 Aromatics	BDL/0.025	BDL/0.025	4	4	
Volatile Petroleum Hydrocarbons Analytes (µg/L) ⁽¹⁾					
Benzene	BDL/5	BDL/5	2,000	7,000	
Ethylbenzene	BDL/5	BDL/5	4,000	4,000	
Methyl-tert-butyl ether	BDL/5	BDL/5	50,000	50,000	
Naphthalene	BDL/5	BDL/5	6,000	6,000	
Toluene	BDL/5	BDL/5	6,000	50,000	
m,p-Xylenes	BDL/10	BDL/10	6,000 ⁽³⁾	50,000 ⁽⁴⁾	
o-Xylenes	BDL/5	BDL/5	6,000 ⁽³⁾		
Extractable Petroleum Hydrocarbons (mg/L) ⁽¹⁾					
C9-C18 Aliphatics	BDL/0.2	BDL/0.2	1	20	
C19-C36 Aliphatics	BDL/0.2	BDL/0.2	20	20	
C11-C22 Aromatics	BDL/0.2	BDL/0.2	30	30	
Polycyclic Aromatic Hydrocarbons (µg/L) ⁽¹⁾					
Naphthalene	BDL/5	BDL/5	6,000	6,000	
2-Methylnaphthalene	BDL/5	BDL/5	3,000	3,000	
Acenaphthene	BDL/5	BDL/5	5,000	5,000	
Acenaphthylene	BDL/5	BDL/5	3,000	3,000	
Fluorene	BDL/5	BDL/5	3,000	3,000	
Phenanthrene	BDL/5	BDL/5	50	50	
Anthracene	BDL/5	BDL/5	3,000	3,000	
Fluoranthene	BDL/5	BDL/5	200	200	
Pyrene	BDL/5	BDL/5	3,000	3,000	
Benzo(a)anthracene	BDL/5	BDL/5	3,000	3,000	
Chrysene	BDL/5	BDL/5	3,000	3,000	
Benzo(b)fluoranthene	BDL/5	BDL/5	3,000	3,000	
Benzo(k)fluoranthene	BDL/5	BDL/5	3,000	3,000	
Benzo(a)pyrene	BDL/5	BDL/5	3,000	3,000	
Indeno(1,2,3-cd)pyrene	BDL/5	BDL/5	3,000	3,000	
Dibenzo(a,h)anthracene	BDL/5	BDL/5	3,000	3,000	
Benzo(g,h,i)perylene	BDL/5	BDL/5	3,000	3,000	
NOTES: BDL = Below practical quantitation limits. NA = Not Analyzed For. ¹ Milligrams per liter (mg/L) or micrograms per liter (µg/L) as noted. ² MCP Reportable Concentrations (RCs) pursuant to 310 CMR 40.1600. ³ MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2). ⁴ Standard for Total Xylenes. Bold = concentrations above standards.					

115 Wayside Avenue West Springfield, Massachusetts Job # 13997		Table 6 Exposure Point Concentrations for Soil			
Sample Location	S-23 4/24/01	S-32 4/25/01	Exposure Point Concentrations	S-1/GW-3	Method 1 Standards S-3/GW-3
Sampling Date					
Volatile Petroleum Hydrocarbons (mg/kg)⁽¹⁾					
C5-C8 Aliphatics	2.7	5.9	5.9	100	500
C9-C12 Aliphatics	3.8	14	14	1,000	5,000
C9-C10 Aromatics	3.9	18	18	100	500
Volatile Petroleum Hydrocarbons Analytes (µg/kg)⁽¹⁾					
Naphthalene	BDL/51	820	820	100,000	1,000,000
m,p-Xylenes	BDL/100	1,800	1,800	500,000	2,500,000
o-Xylenes	BDL/51	880	880	500,000	2,500,000
Extractable Petroleum Hydrocarbons (mg/kg)⁽¹⁾					
C9-C18 Aliphatics	BDL/40	81	81	1,000	5,000
C19-C36 Aliphatics	BDL/40	32	32	2,500	5,000
C11-C22 Aromatics	BDL/40	104	104	800	5,000
Polynuclear Aromatic Hydrocarbons (µg/Kg)⁽¹⁾					
Naphthalene	BDL/190	720	72	100,000	1,000,000
2-Methylnaphthalene	BDL/190	2,200	2,200	500,000	1,000,000
Fluorene	250	BDL/170	250	1,000,000	4,000,000
Phenanthrene	BDL/190	280	280	100,000	100,000
Pyrene	220	BDL/170	220	700,000	5,000,000

NOTES: BDL = Below practical quantitation limits.

NA = Not Analyzed For.

NS = No Standard

¹Milligrams per kilograms (mg/Kg) or micrograms per kilograms (µg/Kg) as noted.

²MCP Method 1 Soil Standards from Table 2, 310 CMR 40.0975 (6)(a).

³Standard for Total Xylenes.

⁴Standard for Total PCBs.

* Area was excavated

Bold = Concentrations Above Standards.

115 Wayside Avenue West Springfield, Massachusetts Job # 13997		Table 7 Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-1	
Sample Location		MW-1	Method 1 Standards ⁽³⁾
Sampling Date			GW-3
Volatile Organic Compounds (µg/L) ⁽¹⁾			
1,1,1-trichloroethane		88	50,000
Tetrachloroethene		17	5,000
NOTES: BDL = Below practical quantitation limits. NA = Not Analyzed For. ⁽¹⁾ Milligrams per liter (mg/L) or micrograms per liter (µg/L) as noted. ⁽³⁾ MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2). ⁽⁴⁾ Standard for Total Xylenes. Bold = concentrations above standards.			

115 Wayside Avenue West Springfield, Massachusetts Job # 13997		Table 7 Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-2	
Sample Location		MW-2	Method 1 Standards ⁽³⁾
Sampling Date		7/24/00 or 5/9/01	GW-3
Volatile Organic Compounds (µg/L) ⁽¹⁾			
1,1,1-trichloroethane		725	50,000
Tetrachloroethene		11	5,000
1,1-Dichloroethane		34	50,000
1,1-Dichloroethene		13	50,000
Trichloroethene		3.1	20,000
cis-1,2-dichloroethene		9.2	50,000

NOTES: BDL = Below practical quantitation limits.

NA = Not Analyzed For.

¹Milligrams per liter (mg/L) or micrograms per liter (µg/L) as noted.

³MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2).

⁴Standard for Total Xylenes.

Bold = concentrations above standards.

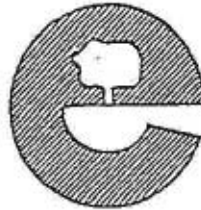
115 Wayside Avenue West Springfield, Massachusetts Job # 13997		Table 7 Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-3	
Sample Location		MW-3	Method 1 Standards ⁽³⁾
Sampling Date		7/24/00 or 5/9/01	GW-3
Volatile Organic Compounds (ug/L) ⁽¹⁾			
1,1,1-trichloroethane		725	50,000
Tetrachloroethene		11	5,000
1,1-Dichloroethane		34	50,000
1,1-Dichloroethene		13	50,000
Volatile Petroleum Hydrocarbons Analytes (ug/L) ⁽¹⁾			
Methyl-tert-butyl ether		3.2	50,000
NOTES: BDL = Below practical quantitation limits. NA = Not Analyzed For. ⁽¹⁾ Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted. ⁽³⁾ MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2). ⁽⁴⁾ Standard for Total Xylenes. Bold = concentrations above standards.			

115 Wayside Avenue West Springfield, Massachusetts Job # 13997		Table 7 Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-4	
Sample Location		MW-4	Method 1 Standards ⁽³⁾
Sampling Date			GW-3
Volatile Organic Compounds (µg/L) ⁽¹⁾			
1,1,1-trichloroethane		725	50,000
Tetrachloroethene		11	5,000
1,1-Dichloroethane		34	50,000
1,1-Dichloroethene		13	50,000
NOTES: BDL = Below practical quantitation limits. NA= Not Analyzed For. ⁽¹⁾ Milligrams per liter (mg/L) or micrograms per liter (µg/L) as noted. ⁽³⁾ MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2). ⁽⁴⁾ Standard for Total Xylenes. Bold = concentrations above standards.			

115 Wayside Avenue West Springfield, Massachusetts Job # 13997		Table 7 Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-5	
Sample Location		MW-5	Method 1 Standards ⁽³⁾
Sampling Date			GW-3
Volatile Organic Compounds (ug/L) ⁽¹⁾			
1,1,1-trichloroethane		60	50,000
trans-1,2-dichloroethylene		65	50,000
Trichloroethene		58	20,000
Tetrachloroethene		78	5,000
1,1-Dichloroethane		11	50,000
NOTES: BDL = Below practical quantitation limits. NA = Not Analyzed For. ⁽¹⁾ Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted. ⁽³⁾ MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2). ⁽⁴⁾ Standard for Total Xylenes. Bold = concentrations above standards.			

APPENDIX A

*Previous Reports – 1994 Report
2000 Report*



ENVIRONMENTAL COMPLIANCE SERVICES, INC.

ENVIRONMENTAL SITE ASSESSMENT
115 WAYSIDE AVENUE
WEST SPRINGFIELD, MASSACHUSETTS

Prepared For:

Mr. Richard Gagnon
Commercial Disposal Co., Inc.
115 Wayside Avenue
West Springfield, Massachusetts 01090

For Use By:

Park WestBank & Trust Company
225 Park Avenue
West Springfield, Massachusetts 01089

Prepared By:

Environmental Compliance Services, Inc.
588 Silver Street
Agawam, Massachusetts 01001

File No. 12142A.21E
Document No. 8585
September, 1994



ENVIRONMENTAL COMPLIANCE SERVICES, INC.

September 29, 1994

File No. 12142.00

Document No. 8585

Mr. Richard Gagnon
Commercial Disposal Co., Inc.
115 Wayside Avenue
West Springfield, MA 01060

RE: Environmental Site Assessment
Commercial Disposal
115 Wayside Avenue
West Springfield, Massachusetts

Dear Mr. Gagnon:

Environmental Compliance Services, Inc. (ECS) has completed an Environmental Site Assessment of the commercial property currently operated as Commercial Disposal, located at 115 WaySide Avenue in West Springfield, Massachusetts (the site) (Figure 1, Site Locus). This assessment included: background research at the West Springfield City Offices, West Springfield Fire Department; a review of state and federal environmental databases and files regarding the site and surrounding properties; review of available documentation regarding closure of the site as a Resource Conservation and Recovery Act (RCRA) Transfer, Disposal, Storage Facility (TSDF); and groundwater sampling and analyses. The purpose of this assessment was to render an opinion as to the presence of oil and/or hazardous materials at the site within the provisions of Massachusetts General Laws (MGL) Chapter 21E and the applicable implementing regulations, the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

The research portion of the assessment is presented as Attachment I to this letter. The Site Locus and Site Plan are included as Figure 1 and Figure 2, respectively. A summary of previous and current groundwater analyses and reportable concentrations are presented on Table I. The reports of laboratory analysis for groundwater samples are included as Attachment III. A summary of the findings of the assessment, as well as conclusions and recommendations, are presented within.



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Commercial Disposal Co., Inc.
September 29, 1994

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1.00 - SUMMARY

1.10 - Location Description and Setting

The site consists of approximately 2.13 acres of land located approximately 750 feet west of the Connecticut River at the intersection of Wayside Avenue and Town Way in West Springfield, Massachusetts (the site) (Site Locus, Figure 1). The property is listed at the West Springfield Assessor's Office as Parcel Code 499 on Map 81, owned by Commercial Disposal Co., Inc. The site is located in a commercial and industrial area with some residential properties located in the vicinity of the site.

The present building, consisting of approximately 14,100 square feet of floor space, is currently used for an office, warehouse and repair garage for Commercial Disposal. Utilities available on the site include natural gas, electrical and telephone services, and municipal sanitary sewer and drinking water supply. Surface drainage flows either to a storm drain on-site and abutting roadways toward a drainage pipe that discharges to the north of the site parking areas or into a Connecticut River overflow detention basin located to the north of the site.

Abutting properties include: Capital Insulation to the west; West Springfield flood control property to the north; Bearings Specialty Co., Northeast Precision and K-Link Rigging Products and a residential house located to the south; and Town Way located to the east (Site Plan, Figure 2).

The topography of the site slopes gently from the west down towards the east. A topographic depression associated with a Connecticut River Overflow basin is located directly to the northeast of the site.

1.20 - History of Development

According to available historical records at the City of West Springfield Library, the site has housed Commercial Disposal since the mid 1980s. Prior to that time the site was occupied by Capital Insulation in the 1970s and New England Roto engraving in the 1960s and 1970s. The easterly portion of the site along Town Way formerly supported Legers Rubbish Removal Corp. Division of Waste Management in the 1960s and 1970s. No on-site development was documented prior to the 1960s.



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The area of the site was developed for residential use prior to 1930 and remained residential in nature until the 1950s. The southerly abutter at 121 and 123 Wayside Avenue remains as a residential property. Other properties abutting the site have supported commercial and industrial businesses since the 1950s.

1.30 - Regulatory Information

1.31 - On-Site

A review of Western Regional Office of the Massachusetts Department of Environmental Protection (DEP), City of West Springfield Fire Department, and West Springfield City Clerk's Office records revealed the following information:

- The site was formerly a Transport, Storage or Disposal Facility (TSDF) as defined by 310 CMR 30.00 Resource Conservation and Recovery Act (RCRA). Storage of hazardous waste on the site was discontinued in 1987.

The facility underwent a RCRA closure study performed by HRP Associates Inc. of Plainville Connecticut. Based on the study a closure certification and change of status form were filed by Commercial Disposal in July 1993. The closure study included the removal of above ground hazardous waste storage tanks and removal of soil from a hazardous waste drum storage area. This area is designated as a previously excavated area on the Site Plan, Figure 2. Groundwater monitoring wells were installed on the site and groundwater samples were obtained for quantitative analyses. Several chlorinated solvents were detected in groundwater on the site.

On January 25, 1994 a letter indicating that the closure satisfied the requirements of 310 CMR 30.587 was issued by the Massachusetts Department of Environmental Protection, Boston, Massachusetts. The letter indicated that no post closure requirements were imposed by the DEP. Groundwater contamination, however, was detected on the site and the letter indicated that the groundwater contamination should be compared to the standards of the Massachusetts Contingency Plan 310 CMR 40.0000.

- The site is not listed on the U.S. EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list, or on the DEP's List of Confirmed Disposal Sites or Locations to be Investigated (LTBI).



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- The site is a small quantity generator of waste oil. According to a May 24, 1993 Compliance Inspection of the site, a waste oil space heater is permitted for use to burn up to 2,000 gallons of waste oil per year on the site. Approximately 1,650 gallons of waste oil were burned on site for heating. The waste oil material is stored in a 250-gallon above ground storage tank. According to the file two parts cleaners are used on site and utilize naphtha for cleaning solvent. No floor drains or waste water discharges were noted in the area of the waste oil burner.
- Emergency Response incident reports regarding the site indicate that approximately 30 gallons of diesel fuel was spilled at the site on December 1, 1992. The spill was cleaned by Oil Recovery of West Springfield, MA. The DEP closed this case on December 4, 1992. On July 22, 1993, 20 to 50 gallons of hydraulic oil was released to the site from a hydraulic line on a dump truck. The file indicates that approximately 1.73 tons of absorbent material was used to cleanup this spill. Also, on October 21, 1994, approximately 3 gallons of fuel oil was spilled from an oil delivery truck and on April 30 1986 approximately 5 gallons of diesel was spilled during an overfill of a storage tank. These spills were covered with absorbent and cleaned up by Commercial Disposal.
- One 10,000 gallon underground storage tank on the site failed a tank test in April 1986. The tank was retested and passed the second tank test. The failure of the testing was attributed to an air pressure loss from a manhole which had not been considered.
- Fire department records indicate that the site is currently equipped with (2) 1,000 gallon and (1) 10,000 gallon underground storage tanks. The 1,000 gallon tanks contain hydraulic oil and lubricating oil and the 10,000 gallon tank contains diesel fuel. These tanks were installed in 1989. Tanks with an approximately capacity of 14,000 gallons were removed from the site in 1988 and 1989. No indication of a release from these tanks was noted in fire department files.
- A review of the DEP/Mass GIS Map for Natural Resources/Western Region indicated that the site and vicinity are mapped as an area underlain by a medium-yield aquifer which is considered potentially productive. No public water supply is located in the vicinity of the site.



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1.32 - Off-Site

There are no locations within a one-mile radius of the site which appear on the USEPA CERCLIS list.

There are two locations in the immediate vicinity of the site that are on the DEP's Confirmed Disposal Sites/LTBI List. Former Sanford Tool at 79 Wayside Avenue and property located at 35 Doty Circle both located approximately 200 feet west of the site. (Attachment I).

The file for Sanford Tool indicates that groundwater flow is toward the north at this site. Groundwater sample analyses for downgradient monitoring wells on the north side of the site indicate the presence of chlorinated solvents (1,1,1-trichloroethane and trichloroethylene) in groundwater.

Leaking underground storage tank incidents have occurred at the UPS facility to the south of the site across Wayside Avenue and at 124 Ashley Avenue which is approximately 0.3 of a mile to the south of the site. No emergency response incidents were indicated on abutting sites. The UPS facility across Wayside Avenue had a release to floor drains on there property which discharged to the Connecticut River (Attachment I).

Brinks at 35 Doty Circle, Standard Industrial Supply 154 Wayside Avenue and UPS at 120 Wayside Avenue have been licensed for underground storage tanks.

1.40 - Site Visit

Site visits were performed by Mr. Glenn Riddle of ECS on August 2, and 29, 1994. Mr. Don LaFerriere, Operations Manager was present to answer questions concerning the property and buildings. The following general observations were made during the site visit:

- The on-site buildings are comprised of a one-story concrete block office building and a one-story maintenance garage building. The site buildings house Commercial Disposal Offices and the garage building is utilized by both Commercial Disposal and Oil Recovery for maintenance of vehicles. Trucks associated with the solid waste transporting are parked on the northeastern portion of the site.



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Mr. Richard Gagnon
Commercial Disposal Co., Inc.
September 29, 1994

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- A paved parking area is located to the east of the office building and the majority of the site is either paved or covered by buildings.
- The current heating method utilized for the office building is natural gas. Natural gas is also used to fuel the heating system in the garage building and is supplemented by a waste oil burning heater for which the DEP has issued a permit. According to Mr. Richard Gagnon no hazardous waste is generated on the site. Waste oil generated from the maintenance of vehicles on the site is stored and burned in bay 4 as depicted on the site plan, Figure 2.
- Oils and hazardous materials related to the businesses are stored on site inside the building area (Attachment I). Sanitary waste generated on the site is discharged to the municipal sewer system. According to Commercial Disposal, waste water discharged to floor drains within the site building is discharged to an oil/water separator which is connected to the municipal sewer system.

2.00 - FIELD INVESTIGATIONS

2.10 - Investigatory Approach

Four of five groundwater monitoring wells located on or near the site were accessed, sampled and samples were analyzed to evaluate the potential presence of oil or hazardous material in the environment of the site. A fifth monitoring well designated MW-5 could not be located by ECS. Previous investigation indicate that these sampling locations are downgradient to potential sources of oil or hazardous material on the site. The locations of monitoring wells were approximated from available information on the Site Plan, Figure 2.

2.20 - Methodology

2.22 - Groundwater Sampling

On August 9, 1994, monitoring wells were gauged for depth to water and total depth using a decontaminated electronic water level indicator. The volume of standing water in each well was calculated and between five and six well volumes of groundwater were purged from each well using pre-cleaned stainless steel bailers suspended with virgin polypropylene rope. Groundwater samples were collected in duplicate 40 milliliter (ml) teflon-septa vials for VOC analysis by EPA Method 624, and in one liter glass containers for TPH analysis by GC via EPA Method 8100. These analyses were selected due to the current property uses. Samples collected for VOC

2.21 - EP
SOLC



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and TPH analyses were preserved with concentrated hydrochloric acid to achieve a pH less than 2 in the sample. All samples were refrigerated on-site and during transport to a Massachusetts-certified laboratory following chain of custody protocol.

A sample from each monitoring well was collected for on-site measurement of temperature, pH, and specific conductance, and to permit observation of pertinent characteristics such as the presence of an odor or a sheen.

2.30 - Results and Discussion

2.31 - Groundwater Quality

2.32 GW)
As presented in Table 1 no total petroleum hydrocarbons were detected in the groundwater samples collected from wells MW-2 through MW-5. Volatile organic compounds were detected in each of the remaining monitoring wells. The site is in an area designated as GW-1: a potentially productive aquifer. Concentrations of volatile organic compounds which exceed reporting category GW1 are present only in monitoring wells MW-2, -4, and -5. Only tetrachloroethylene is present in concentrations which exceed the reporting category.

During sampling a slight petroleum odor was noted in the sample from well MW-2. Laboratory analyses indicate that trace concentrations of petroleum constituents are present.

3.00 - CONCLUSIONS

3.10 - Conclusions

During this environmental site assessment, no evaluation of the presence of lead paint, urea formaldehyde foam insulation, or asbestos-containing materials was performed on the site. A limited program of groundwater sampling and analyses was performed on the site to assess the condition of the site with respect to oil or hazardous material. Groundwater samples were obtained from monitoring wells installed by others as part of a previous study. The conclusions made in this report are limited according to these qualifications, and the limitations presented as Attachment IV.

Based on the information obtained during this assessment, it is the opinion of ECS that groundwater contamination is present on the site. The concentrations of groundwater contamination are relatively low but do exceed the concentration for reporting for the site area



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at one well location. The use of the site as a RCRA storage and transport facility required closure of the site after these operations ceased. Subsequent studies of the site have fulfilled the closure requirements, however, the groundwater contamination on the site must be compared to the standards presented in the Massachusetts Contingency Plan 310 CMR 40.0000. As noted above, these groundwater standards are exceeded at the site. However, the concentrations of these constituents in groundwater are not likely to warrant remediation of the site.

The area of the site has supported many industrial properties which have utilized oil and hazardous materials. The current use of the site does not suggest that the presence of chlorinated solvents is associated with current on-site activity. A near-by property, former Sanford Tool, to the west of the site also has contaminated groundwater. Groundwater flow at this facility does not indicate that this site is downgradient from the former Sanford Tool facility. In addition, the contaminant which exceeds groundwater standards on the site, Tetrachloroethylene, is not present at the former Sanford Tool site.

Therefore, the source of the reportable concentration of contamination on the site has not been identified.

If there are any questions concerning this information, please do not hesitate to contact our office.

Sincerely,
ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Richard A. Starodaj
Richard A. Starodaj
Environmental Analyst

Glenn D. Riddle
Glenn D. Riddle
Senior Project Manager

RAS/GDR/jm
Attachments

Table 1
Quantitative Analyses of Groundwater
Commercial Disposal
West Springfield, Massachusetts

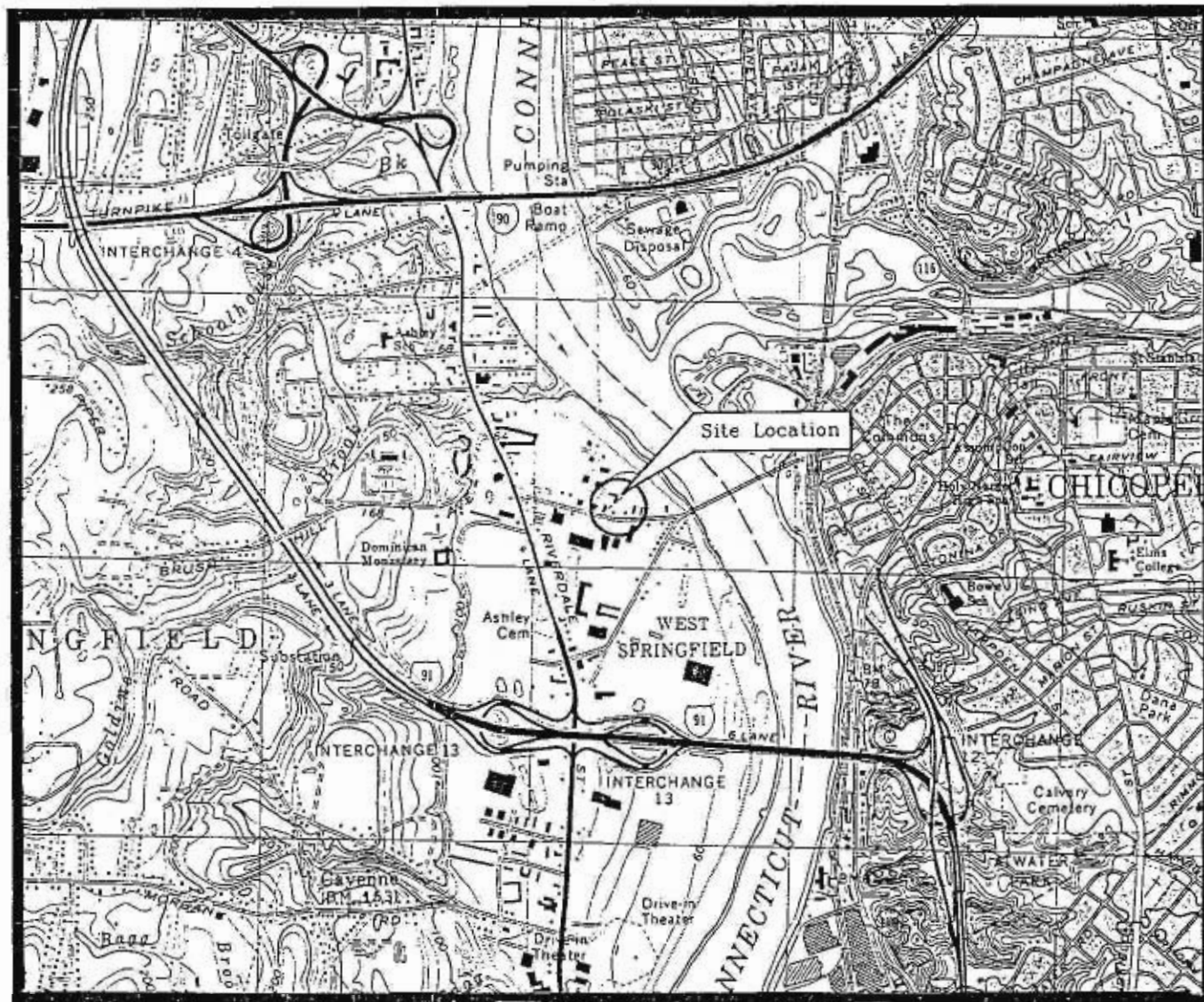
CONSTITUENT ($\mu\text{G/L}$)	DATE	MW-1	MW-2	MW-3	MW-4	MW-5	GW-1 STANDARD $\mu\text{G/L}$
TPH	8/9/94	NT	BDL	BDL	BDL	BDL	NA
MTBE	8/9/94	NT	BDL	3.2	BDL	BDL	700
Benzene	8/9/94	NT	3.3	BDL	BDL	BDL	5.0
o-Xylene	8/9/94	NT	6.7	BDL	BDL	BDL	6,000
1,1,1- Trichloro ethane	11/3/89	88	109	90	725	60	200
	10/23/90	BDL	1.0	7.0	40	2.0	
	4/12/91	BDL	BDL	6.0	1.0	BDL	
	8/9/94	NT	1.3	3.4	6.5	BDL	
T-1,2-Dichloro ethylene	11/3/89	BDL	BDL	BDL	BDL	65	100
	10/23/90	BDL	BDL	BDL	BDL	27	
	4/12/91	BDL	BDL	BDL	BDL	10	
	8/9/94	NT	BDL	BDL	BDL	BDL	
Trichloro ethylene	11/3/89	BDL	BDL	BDL	BDL	26	5.0
	10/23/90	BDL	BDL	BDL	BDL	58	
	4/12/91	BDL	BDL	BDL	BDL	14	
	8/9/94	NT	BDL	BDL	BDL	9.5	
Tetrachloroet hylene	11/3/89	17	11	11	BDL	78	5.0
	10/23/90	BDL	BDL	BDL	BDL	26	
	4/12/91	BDL	BDL	2	BDL	12	
	8/9/94	NT	5.4	2.8	11	34	
1,1-Dichloro ethane	11/3/89	BDL	BDL	BDL	34	11	70
	10/23/90	BDL	BDL	BDL	BDL	BDL	
	4/12/91	BDL	BDL	BDL	BDL	BDL	
	8/9/94	NT	BDL	BDL	BDL	1.4	
1,1-Dichloro ethylene	11/3/89	BDL	BDL	BDL	13	BDL	1.0
	10/23/90	BDL	BDL	BDL	BDL	BDL	
	4/12/91	BDL	BDL	BDL	BDL	BDL	
	8/9/94	NT	BDL	BDL	BDL	BDL	

Notes: TPH = Total Petroleum Hydrocarbons
MTBE = Methyl-t-Butyl Ether
 $\mu\text{g/L}$ = micrograms per liter
BDL = Below Detection Limit
NT = Not Tested (Well could not be located).

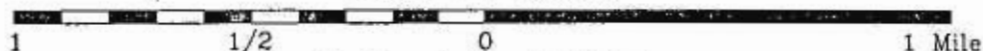


ENVIRONMENTAL COMPLIANCE SERVICES, INC.

588 Silver Street * Agawam, MA 01001



Scale 1 : 25,000



Contour Interval 10 Feet

Base Map: U.S. Geological Survey; Quadrangle Location: Springfield North, Massachusetts

Map Edited: 1972

Photorevised: 1979

Photinspected: None

North



Commercial Disposal Co., Inc.

115 Wayside Avenue

West Springfield, Massachusetts

AutoCAD File: LOC.DWG

Site Locus

Job No.: 12142.00

September 1994

Figure - 1

ADMINISTRATIVE INFORMATION	
PROJECT NUMBER: 12142A.21E	
DATE STARTED: August 2, 1994	DATE COMPLETED: September 29, 1994
CLIENT: Commercial Disposal	SITE: Commercial Disposal
CLIENT ADDRESS: 115 Wayside Avenue	ADDRESS: 115 Wayside Avenue and 17 Town Way, West Springfield, Massachusetts
CLIENT CONTACT: Mr. Richard Gagnon	CONTACT ON SITE: Mr.
PHONE: (413) 737-1129	PHONE: (413) 737-1129
CLIENT FILE NO.	
CONTENTS OF ASSESSMENT: SECTION 1 - SITE LOCATION & SETTING SECTION 2 - LOCAL RECORDS REVIEW AND INTERVIEWS WITH LOCAL OFFICIALS SECTION 3 - LOCAL HISTORY SECTION 4 - FEDERAL ENVIRONMENTAL RECORDS SECTION 5 - STATE ENVIRONMENTAL RECORDS SECTION 6 - SITE VISIT	COUNTY: Hampden
	STATE: Massachusetts
	NEAREST INTERSECTION / CROSS STREET:
	Wayside Avenue and Doty Circle
CONFIDENTIALITY:	
Standard	
MISCELLANEOUS ADDITIONAL INFORMATION:	

SITE LOCATION

USGS QUADRANGLE MAP: Springfield-North

LATITUDE: 42°08'37"

LONGITUDE: 72°37'28"

UTM COORDINATES: 468775N
696325E

LOCATION OF SITE RELATIVE TO LANDMARKS:

The site is located approximately 2,900 feet north of the Route 91, Route 5 interchange in West Springfield and about 750 feet west of the Connecticut River.

SITE SETTING

REGIONAL DEVELOPMENT:

The area to the northwest, west, south and southeast is primarily associated with light industrial and commercial enterprises. The area to the north and northeast contain flood control dikes and stormwater pump stations.

REGIONAL TOPOGRAPHY:

Regional topography is flat, given the areas location in the Connecticut River Flood Plain.

ELEVATIONS:

Based on USGS Topographical Maps, the area is at an approximate elevation of 60 mean sea level with the Connecticut River being at approximately 49 feet.

REGIONAL DRAINAGE:

Storm runoff in this area is collected by sewer and is charged into the Connecticut River at the end of Wayside Avenue.

SURFACE WATER:

Surface Water On-site:

No surface water bodies are located on site.

Surface Water Adjacent to the site:

No surface water is located adjacent to the site.

Note: A stormwater detention area just over the northern border is normally dry, except in extreme storm events.

WETLANDS

Wetlands On-site:

None indicated.

Wetlands Adjacent to the Site:

None indicated.

WETLANDS INVENTORY MAPS:

Name of Map: Springfield-North, Mt. Tom

Date: October, 1975

FLOODING POTENTIAL:

ON AND IN THE VICINITY OF THE SITE:

The site is located in the Connecticut River Flood Plain. However, it is protected by an extensive series of dike built by the Army Corps of Engineers in the late 1930s and early 1940s.

FLOOD INSURANCE RATE MAP (FIRM):

FIRM Maps were not reviewed as part of the present assessment.

SITE GEOLOGY:

SOILS:

Classification:

UH - Urban Land Hadley Winooski Association

Characteristics:

Soils are deep and moderately drained, slopes are 0 to 8 percent. Surface layer is friable, dark gray-brown loam for 12 inches. Substratum is to a depth of 60 inches. Alternating layers of olive silt and fine sand with gray and yellow-red mottles. Permeability is high, as is water capacity.

Information Source:

Sheet 17, Page 52 - USDA Soil Conservation Service, Soil Survey of Hampden County, Central Part, issued May of 1978.

SURFICIAL GEOLOGY:

Sand deposits and fine deposits, undifferentiated.

Estimated Thickness:

Unknown.

Information Source:

Map showing distribution and thickness of the principal fine graine deposits, Connecticut Valley Urban Area, Central New England, by William H. Langer, Map I-1074-C, Sheet 2 of 2.

BEDROCK GEOLOGY:

Hartford Basin, Portland Formation (Lower Jurassic). Reddish-brown to pale red arkose and siltstone, and gray sandstone, gray siltstone, and black shale interpreted as lake beds.

Description:

Information Source:

Bedrock Geologic Map of Massachusetts, E-an, Zen, Editor, 1983.

Contact:

Date:

Time:

September 27, 1994 10:15 - 11:00 am

PRESENT OWNER OF RECORD: Commercial Disposal Company, Inc.

DATE OF PURCHASE: Not Specified

LISTED ADDRESS: 195 Wayside Avenue
West Springfield, Massachusetts 01089

MAP AND PARCEL NUMBER(S): Map 81, Parcel 499

DEED BOOK AND PAGE: 5614/80

AREA: 2.13 Acres in Parcels

HEAT SOURCE: Gas forced hot air.

UTILITY SERVICES ON-SITE: Gas, electricity, sewer, telephone, and water.

Notes:

ASSESSOR'S OFFICE INFORMATION			
BUILDINGS OR STRUCTURES ON SITE			
LOCATION	CONSTRUCTION	NUMBER OF FLOORS	AREA (SQUARE FEET)
115 Wayside Avenue	Masonry Construction	1	Not Specified
17 Town Way	Masonry Construction	1	Not Specified

ASSESSOR'S OFFICE INFORMATION

ABUTTING PROPERTIES

OWNER NAME/ ADDRESS	MAP AND PARCEL NUMBER	LOCATION OF PROPERTY RELATIVE TO SITE	USE	COMMENTS (WATER SUPPLIES, SEPTIC ETC., LOCATION RELATIVE TO SITE)
William Parentau 103 Wayside Avenue	81-514 2850-81	Southwest	Commercial	All developed properties in the vicinity of the site are presumed to be connected to all public utilities.
Nellie A. Kulik 121-123 Wayside Avenue	81-414 3200 0081	South	Commercial	
E & L Realty Corporation 131 Wayside Avenue	81-514 3200 0081	South	Commercial	
Robert J. Healy 149 Wayside Avenue	3300 0081	South	Commercial	
Robert J. Healy 161 Wayside Avenue	3400 0081	South	Commercial	
Robert Clark, Jr. 181 Wayside Avenue	3350 0080A	South	Commercial	
Hurley & Johnson 34 Doty Circle	81-221 8700 0081	West	Commercial	
Leon W. Jaeger, Jr. 46 Doty Circle	81 - 221 8750 0081	West	Commercial	
Town of West Springfield Flood Control Dike Town Way		North	Flood Control	

BUILDING INSPECTORS / ENGINEERING OFFICE

Contact:

Date:

Time:

Personnel

September 29, 1994 10:20 am

BUILDING INSPECTOR'S OFFICE / ENGINEERING OFFICE				
BUILDINGS / STRUCTURES PRESENT ON SITE				
BUILDINGS / STRUCTURES	LOCATION ON SITE	AGE	CONSTRUCTION	COMMENTS
Offices	115 Wayside Avenue	Not Specified	Concrete Block	
Garage	West End of Town Way	Not Specified	Concrete Block	

Notes: Building Department has following permits on file for Commercial Disposal: November 29, 1988, Rebound Storage Building damaged by fire, 250 feet off road, heated by gas; October 9, 1984, New storage at 17 Town Way, no heat.

UTILITY CONNECTIONS / AVAILABILITY (ON-SITE):

Water: Yes

Sewer: Yes

Stormwater: Yes

Electric: Yes

Gas: Yes

UTILITY CONNECTIONS / AVAILABILITY (IN STREET):

Water: Yes

Sewer: Yes

Stormwater: Yes

Electric: Yes

Gas: Yes

ZONING COMMISSION / PLANNING BOARD:

<u>Contact:</u>	<u>Date:</u>	<u>Time:</u>
Nancy Manchino	September 27, 1994	12:30 pm

SITE ZONING:

Designation: Business B: Across street is industrial park.

Effective Date: 1989

ADJACENT PROPERTIES:

Designation: Industrial Park (IP)

Effective Date: 1989

PREVIOUS DESIGNATIONS (WITH DATES AND LOCATIONS RELATIVE TO SITE):

Unknown.

ANTICIPATED CHANGES:

On-Site: None

Neighboring Properties: None

CONSERVATION COMMISSION:

The Conservation Commission was not contacted as part of the present assessment

HEALTH DEPARTMENT:

Contact:

Mary Liquori

Date:

September 27, 1994

Time:

12:15 pm

WATER SUPPLIES:

On-Site:

West Springfield Municipal System

Testing:

No testing information was reviewed.

Off-Site:

West Springfield Municipal System

NATURE AND LOCATION OF MUNICIPAL WATER SUPPLY:

Southwick Wells and Bearhole Reservoir

TOWN CLERK'S OFFICE

Contact:

Pat Whitehead

Date:

September 27, 1994

Time:

1245 pm

TOWN CLERK'S OFFICE PERMIT LISTING SEARCH DISTANCE ON-SITE AND NEIGHBORING PROPERTIES			
DATE OF REVIEW:		SEPTEMBER 27, 1994	
LOCATION	DATE	PERMIT TYPE	COMMENTS
United Parcel Service Wayside Avenue	11/23/65	700 Gallons AST	
	11/23/65	15,000 Gas & Diesel UST	
	8/28/91	12,000 Gallons Gasoline UST	
	8/28/91	11,000 Gallons Diesel UST	
154 Tri-County Contractors 35 Doty Circle	6/28/60	4,000 Gallons Gasoline AST	
	8/19/70	1,000 Gallons UST	
Brinks, Inc. ↗	↘	4,000 Gallons UST	

Notes: AST - Above Ground Storage Tank
UST - Underground Storage Tank

FIRE DEPARTMENT:

Contact:

Date:

Time:

Deputy Chief Ralph Danforth September 29, 1994

FIRE DEPARTMENT FILE REVIEW UNDERGROUND STORAGE TANKS SEARCH DISTANCE ON-SITE AND NEIGHBORING PROPERTIES							
LOCATION	SIZE (GALLONS)	CONSTRUCTION	CONTENTS	AGE (YEARS)	INSTALLED ¹	REMOVED	COMMENTS (CATHODIC PROTECTION, REPAIRS AND DATES, RELINING (DATE), NOTICE OF LEAKS (DATES), TRANSFER LINES AND PIPING)
17 Town Way	3,000	NS	NS	NA	12/17/73	10/10/86	No record of release
	1,000	NS	NS	NA	12/17/73	11/18/88	No record of release
	10,000	NS	NS	NA	12/17/73	8/28/89	No record of release
	1,000	NS	Oil	5	8/29/89	N/A	NS
	1,000	NS	Hydraulic Oil	5	8/29/89	N/A	NS
	10,000	NS	Diesel	5	8/29/89	N/A	NS
35 Doty Circle	4,000	NS	Gasoline	NA	8/19/70	4/22/88	Tank failed tightness test but no evidence of release noted upon removal of tank.
154 Wayside Avenue	4,000	NS	No. 2 Fuel Oil	34	6/28/60	N/A	
120 Wayside Avenue	15,700	NS	NS	29	11/23/65	N/A	Water readings indicated possible problems.
	4,000	NS	Diesel	N/A	NS	9/23/91	
	1,000	NS	No. 2 Fuel Oil	N/A	NS	9/23/91	
	(2) 550	NS	Waste Oil	N/A	NS	9/23/91	
	15,000	NS	NS	3	11/29/91	N/A	These tanks for diesel and gasoline.
	(2) 10,000	NS	NS	3	11/29/91	N/A	

FEDERAL ENVIRONMENTAL RECORDS

CERCLIS L - 8 LISTINGS
(USEPA COMPREHENSIVE ENVIRONMENTAL RESPONSE, SEARCH DISTANCE:

NO CERCLIS sites are located within 1 mile of the site.

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) LIST OF HAZARDOUS MATERIALS

HANDLERS/GENERATORS

TSD = 1.0 MILES

GENERATORS - ON-SITE AND NEIGHBORING PROPERTIES:

The site is listed as a TSD facility but is awaiting a change of status. The site is also listed as a small quantity generator of hazardous waste.

Numeric Machine Co., Inc., which is located to the south of the site (abutter), is also a small quantity generator of hazardous waste.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION		
EMERGENCY RESPONSE (ER) FILE REVIEW		
SEARCH DISTANCE ON-SITE AND NEIGHBORING PROPERTIES		
FILE LOCATIONS (TOWNS): WEST SPRINGFIELD		
FILE DATES: AS SPECIFIED		
DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
93	No Emergency Response on record.	
5/20/93	74 Wayside Avenue (Mikes Wholesale Bait) Former Samford Tool - Possible Unsafe Use of formaldehydes reported investigated (unfounded) W93-264. OSHA asked to investigate.	200 feet west.
8/28/91	Report of truck discharging milky white substance to storm drain (or Wayside and Doty Circle). Investigated, case closed.	200 feet west.
10/30/90	Booms in river from United Parcel Service. Spill not working right, storm system will be flushed by O.R. Cote to cleanout.	United Parcel Service is south across Wayside Avenue.
7/8/93	United Parcel Service changing floor drains to town sewer. No problem.	Site No.
12/4/72	17 Town Way - Bill of Lading No. 818 issued to dispose of four drums of Kwick Wick at Vicon Recovery. O.R. diesel spill.	Site No. On-site
12/01/92	17 Town Way - Thirty gallons diesel to pavement, nozzle fell out of tank.	On-site
8/26/92	GES while working on another job United Parcel Service floor drains and notify DEP.	
88 - 89	Nothing.	
12/5/87	130 Doty Circle - Fifty gallons hydraulic fluid from rubbish truck.	200 feet west.
10/21/80	Wayside fuel from delivery truck spilled three gallons. Speedi-dry.	On-site
4/20/86	17 Town Way - Five gallon overfill speedi-dry.	On-site

<p>MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION</p> <p>LEAKING UNDERGROUND STORAGE TANKS FILE REVIEW</p> <p>SEARCH DISTANCE 0.5 MILES</p>		
<p>FILE LOCATIONS (TOWNS): WEST SPRINGFIELD</p> <p>FILE DATES: AS SPECIFIED</p>		
DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
1/27/88	Waste oil overflowed UST. Cyn cleaned.	124 Ashley Avenue 0.3 miles south.
6/6/89	Oil out of storm drain into river from United Parcel Service diesel small overfill	United Parcel Service is across Wayside Avenue to the south.
4/30/86	Commercial Disposal - 10,000 gallon No. 2 diesel test failed tight test	149 Wayside Avenue abutter to the south.
5/15/86	Air released from buried manhole and retested without air interface. Passed (DEP notified by Nancy Frantoni, Compliance Manager, letter sent to West Springfield Fire Department on April 30, 1986.	On-site.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATE LANDFILL OR SOLID WASTE DISPOSAL SITES:

No landfills or solid waste disposal sites were noted within 0.5 miles of the site.

DEPARTMENT OF ENVIRONMENTAL PROTECTION			
SITES FILE REVIEW			
LOCATIONS OF FILES (TOWNS): WEST SPRINGFIELD			
SITE NUMBER	ADDRESS	LOCATION (RELATIVE TO SITE)	CITATION
10849	Agrimark 958 Riverdale Street	0.9 miles southwest of the site.	Waiver Site
10766	Ricks Mobil 1130 Riverdale Street	0.5 miles southwest of the site.	Waiver Site
10929	Exxon Station 1247 Riverdale Street	0.3 miles southwest of the site.	Waiver Site
10898	Red's Exxon 1528 Riverdale Street	0.3 miles northwest of the site.	Waiver Site
10710	Samford Tool 79 Wayside Avenue	200 feet west of the site.	Waiver Site - Review of information in the file and reports indicates that groundwater flow is north and northeast. Groundwater contamination with 1,1,1-trichloroethane and trichloroethylene is present in samples obtained downgradient on the site.
10300	Texaco 928 Riverdale Street	1 mile southwest of the site.	Confirmed
1-0000464	35 Wayside Avenue	200 feet west of the site.	LTBI

WATER SUPPLY OVERLAYS

QUADRANGLES CHECKED: West Springfield

SITE QUADRANGLE: West Springfield

AQUIFER TYPE:

On-site:

M₉ - Capable of yielding 1 to 1,000 gallons per minute to individual wells.

Adjacent to site: M₉

WATER SUPPLIES:

No public water supplies were noted within 1 mile of the site.

CONTAMINATION SOURCES:

A salt storage facility was noted within 0.5 miles southwest of the site.

SITE VISIT:

PERFORMED BY: Glenn Riddle

ACCOMPANIED BY: Mr. Don LaFerriere, Operations Manager

DATE PERFORMED: August 2, 1994 and September 29, 1994

CURRENT USE OF SITE:

Offices and garage for Commercial Disposal. Some space is also utilized by Oil Recovery Corporation.

FORMER USE(S) OF SITE:

The former use of the site was not disclosed during the site visits.

DEVELOPMENT:

Buildings:

Two buildings are located on-site. One building is located close to Wayside Avenue and supports an office building. The second building is a garage building used for maintenance of Commercial Disposal and Oil Recovery vehicles. This building is approximately 200 feet from Wayside Avenue.

Evidence of Former Buildings/Structures:

No evidence of former buildings was noted during the site visits.

CURRENT HEATING METHOD:

The office building is heated a natural gas system. The garage building is also heated by a natural gas system which is supplemented by a waste oil burning heating system located in Bay 4.

Evidence of Former Heating Method(s):

No evidence of former heating methods was noted during the site visit.

WASTE DISPOSAL:

Evidence of Former Waste Disposal Method(s):

ROADWAYS:

Access to the site is gained from either Wayside Avenue to the south of the site or Town Way located to the east of the site.

PARKING AREAS (PAVEMENT, ASPHALT/CONCRETE, CONDITION, AREA AND LOCATIONS COVERED):

Parking for cars along east side of the office building. Parking for trucks in the paved area to the east of the garage building.

CATCHBASINS (STORMWATER):

One stormwater catch basin is located between the office building and Bay 6 of the garage building.

UTILITIES ON SITE:

The site is serviced by natural gas, electricity, telephone, municipal water and municipal sewer connections.

Utilities Formerly on Site:

No evidence of former utilities was noted on the site.

WELLS (DRINKING/INDUSTRIAL/IRRIGATION) PRESENT ON SITE:

Four of five groundwater monitoring wells installed by HRP Associates were located on the site.

FENCING (ACCESS/LIMITATIONS):

Fencing is located along the site boundary to the east and north between the site and West Springfield Flood Control property.

EVIDENCE OF FILLING/EXCAVATION:

An area of the site has been excavated, filled and paved as part of a RCRA closure of the site, however, no evidence of the excavation was noted during the site visit.

OIL AND HAZARDOUS MATERIALS CURRENTLY USED / STORED ON-SITE:

Waste oil containers and a waste oil burner were observed in Bay 4 of the garage building. This waste oil and burner supplements the gas fired heating system. Two above ground storage tanks were also observed in Bay 4. Diesel (500 gallon tank) and lubricating oil (275 gallon tank) owned by Oil Recovery were located in this area. Various automotive repair fluids are utilized in the garage building. One 500-gallon kerosene above ground storage tank in Bay 1 is used to fuel a steam cleaner which is used to clean vehicles. Three underground storage tank (UST) are located on the site. One 10,000-gallon UST (diesel) and two 1,000-gallon USTs (hydraulic oil and engine oil) are located on the site.

FACILITIES PRESENT (ON-SITE):

<u>Floor Drains:</u>	Floor drains in the maintenance building collect wastewater from vehicle maintenance. This waste discharges to
<u>Dry wells/Pits:</u>	None observed.
<u>Machine Pits:</u>	None observed.
<u>Service Pits:</u>	None observed.
<u>Hydraulic Lifts:</u>	None observed.
<u>Pump Islands:</u>	One dispensing pump associated with the 10,000-gallon UST was observed.
<u>Loading Racks:</u>	None observed.

Lagoons: None observed.

Transformers: None observed.

FACILITIES PRESENT (ADJACENT TO SITE):

Pump Islands: UPS which is located south of the site across Wayside Avenue is equipped with a pump island.

Loading Racks: None observed.

Lagoons: None observed.

Transformers: Pole mounted transformers were observed along Wayside Avenue.

VEGETATION (INDICATIONS OF STRESS, ABSENCE OF VEGETATION):

The site is almost entirely paved or covered by buildings. Very little vegetation was observed on-site. Vegetation present around the office building did not appear to be stressed. Vegetation on surrounding property also did not appear to be stressed.

WETLANDS:

No evidence of wetlands was noted during the site visit.

SURFACE SOIL (INDICATIONS OF STAINING, RELEASES):

Incidental oil staining was noted in the paved areas of the site. No surface soil staining was noted during the site visit.

ABUTTING PROPERTIES:

Use:

Abutting properties to the south include a residential house, commercial and industrial businesses and Wayside Avenue. Town Way abuts the site to the east.

Use/Storage/Disposal of Oil/Hazardous Materials:

Commercial and industrial businesses on Doty Circle abut the site to the west.

DRILLING EQUIPMENT STANDARDS

1. Equipment Decontamination

All drilling equipment and associated tools, including but not limited to, augers, drill rods, sampling equipment, wrenches, etc., that may have come in contact with any material which could cause contamination shall be decontaminated using a high pressure detergent steam cleaning equipment, followed by, if needed a nanograde methanol swabbing. This will be followed by a distilled or controlled water rinse. The control water shall be obtained from a source approved by the supervising field representative.

2. Equipment and Materials

All equipment will be in good repair and in proper working order with no visible signs of oil or hydraulic fluid leaks.

The drill rig shall be capable of providing a power driven sectional hollow stem auger flights with a minimum inside diameter of 2 1/2 inches to a minimum depth of 60 feet. In addition, the following equipment shall be available:

- A. Drill Rods, minimum size equivalent to the "A" Rod, (1 5/8 inches O.D. and 1 1/8 I.D.),
- B. 140 lb. Drive Hammer and 300 lb. Drive Hammer,
- C. 2 Inch O.D. Spilt Spoon Sampler,
- D. Hollow Stem Auger Plug,
- E. Roller Bit and Diamond Corer Bit,
- F. Water Tank and Pump,
- G. Any other equipment needed to successfully complete job.

MONITORING WELL CONSTRUCTION

I. Materials

All materials used in the completion of monitoring wells shall be in good condition and free of any signs of possible contamination. The following materials may be used in the completion of monitoring wells:

- 1) 2" Flush Joint Threaded PVC Well Screen and Riser Casing (Schedule 40 or 80)
- 2) Washed Ottawa Sand
- 3) Bentonite Grout
- 4) Portland Cement
- 5) Filter Fabric
- 6) Vented Steel Locking Well Casing and Lock or Curb Box

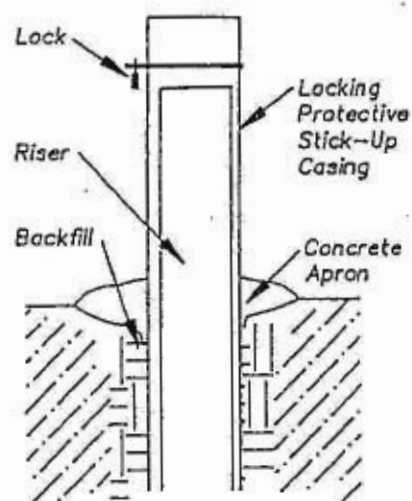
II. Installation

After the selected depth has been reached by augering, placement of a specified length of PVC screen and riser will be installed into the augers. If warranted, filter fabric should be placed on screen prior to insertion into auger to facilitate filtration. Ottawa sand will be used to pack the screen to prevent plugging. Retrack augers to top of screen and measure with weighted tape to ensure the screen has been fully covered. Add enough bentonite until the screen has been sealed off from horizontal and/or vertical flow above the screened interval. Again, measure to assure bentonite is not "hung up" in casing.

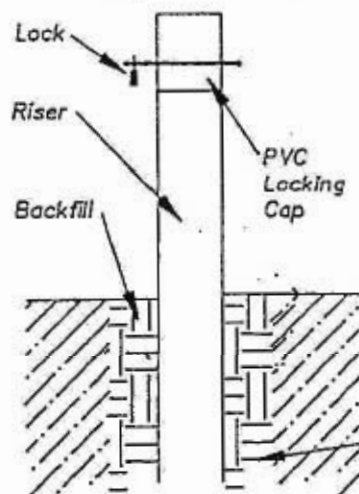
The auger string is again pulled back and natural soils are allowed to collapse. Measurements should be made to assure this collapse. If natural materials are not collapsing, clean ottawa sand will be used to fill the voids. Install an additional bentonite seal two (2) to three (3) feet below ground level.

Once the auger string has been removed the protective steel casing will be installed. Said steel pipe will be secured by a portland cement seal. The cement seal shall be a minimum of two (2) foot in diameter and shall be gently sloped to drain water away from well.

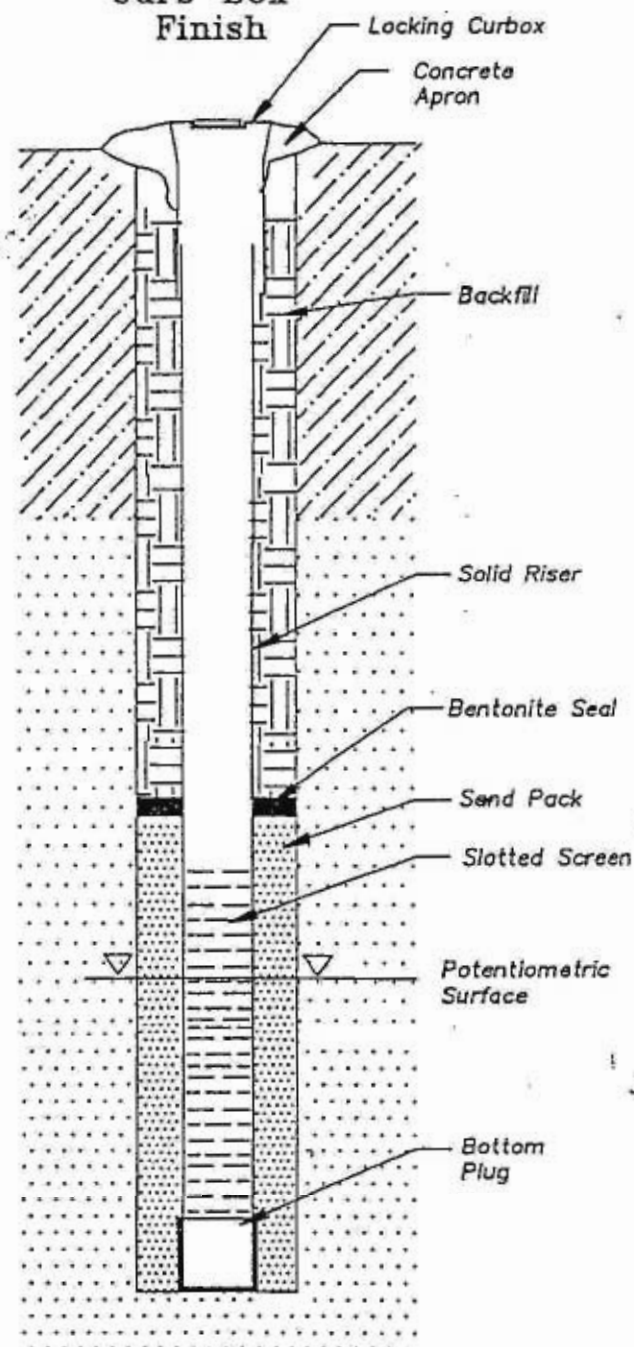
Locking Protective
Pipe Finish



Locking PVC
Cap Finish



Curb-Box
Finish



GROUNDWATER MONITORING WELL With Alternative Finishings

Volatile Organic Compound Screening Procedures

- Soil -

Samples of soil collected from a site are screened in the field or in-house for the presence of volatile organic compounds (VOCs). Soil screening procedures employ headspace techniques to remove a sample in the vapor state for VOC screening. Headspace in the sample container is screened for VOC using the screening procedures outlined below. Screening results are not equivalent to quantitative laboratory results and are not represented as such.

Instrument:

The instrument used by Environmental Compliance Services, Inc. (ECS) for VOC screening of soils is the H-Nu Model PI-101 Organic Vapor Detector which is equipped with a 10.2 eV probe. The H-Nu is calibrated to a benzene gas standard and detects the total gross VOC's in the headspace. The detection limit of the H-Nu is 0.2 ppm for benzene.

Procedure:

The soil screening procedure used is based upon the "Jar Headspace Analytical Screening Procedure" outlined in the Massachusetts Management Procedures for Excavated Soils Contaminated with Virgin Petroleum Oils Policy #WSC-89-001.

1. Half-fill two (2) clean glass jars with the sample to be analyzed. Quickly cover each open top with one or two sheets of clean aluminum foil and subsequently apply screw caps to tightly seal the jars. Sixteen ounce (16 oz.) (approx. 500 ml) soil or "mason" type jars are preferred. Jars less than 8 oz. (approximately 250 ml) total capacity will not be used.
2. Allow headspace development for at least 10 minutes. Vigorously shake jars for 15 seconds both at the beginning and end of the headspace development period. Where ambient temperatures are below 32° F (0° C), headspace development should be performed within a heated vehicle or building.
3. Subsequent to headspace development, remove the screw lid to expose the foil seal. Quickly puncture foil seal with the instrument sampling probe, to a point about one-half of the headspace depth. Exercise care to avoid uptake of water droplets or soil particulates.

4. Following probe insertion through the foil seal and/or sample injection to probe, note and record the higher meter response as the jar headspace concentration. When using the foil seal/probe insertion method, the maximum response should occur between 2 and 5 seconds. Erratic meter response may occur at high organic vapor concentrations or conditions of elevated headspace moisture, in which case headspace data should be discounted. It is reasonable to suspect elevated moisture in the headspace when the H-Nu meter returns to zero in a much slower response when the probe is removed from the headspace.
5. The headspace screening data from both jar samples should be recorded and compared; generally, replicate values should be consistent to plus or minus 20%.
6. PID field instruments shall be operated and calibrated to yield "total organic vapors" in ppm (v/v) as benzene. Operation, maintenance, and calibration shall be performed in accordance with the manufacturer's specifications. For jar headspace analysis, instrument calibration shall be checked/adjusted no less than once every 10 analyses, or daily, whichever is greater.

ECS WATER SAMPLING PROCEDURES

Groundwater Sampling Procedures

Groundwater samples are collected from monitoring wells in accordance with DEP protocol as described in "Standard References for Monitoring Wells", Massachusetts Department of Environmental Protection Publication No. WSC-310-91. Prior to leaving the ECS facility, ECS personnel inspect all equipment and materials to be used during a sampling event to assure that it is in good working order and that it is clean to avoid possible sample contamination. Once in the field, the following procedures are employed in sequence during each sampling event:

1. The well is identified and the individual well designation is recorded on an ECS Monitoring Well Sampling Log.
2. The protective casing is opened, and when appropriate, measurements of the concentration of organic gases in the well casing are made using a portable photoionization detector and recorded.
3. Groundwater level and total depth of the well measurements are made from a designated reference point located at the top of the well casing. An electronic water level indicator or acoustic sounding device accurate to 0.01 feet is used for all measurements. All measurements are recorded on the ECS Monitoring Well Sampling Log. The volume of standing water within the well is calculated and recorded.
4. To insure the collection of a representative groundwater sample, the standing water within the well is purged (evacuated). The procedure used for well purging depends on the hydraulic yield of the well. When purging low yield wells, the well is evacuated to dryness once prior to sampling. In high yield wells, a quantity of water equal to three (3) to five (5) times the standing water purged is recorded on the ECS Monitoring Well Sampling Log. Groundwater is purged from the well using a non-contaminating water pump, a PVC bailer, or a stainless steel bailer. When using a pump, only clean polyethylene tubing is used in each well. In appropriate situations, the polyethylene tubing is stored in the well casing for use during future sampling events. When using a bailer, only virgin polypropylene rope is used to suspend it. Purge volumes are measured by pumping or bailing groundwater directly into a container of known volume. Care is taken to record on the Monitoring Well Sampling Log any "floating" product, petroleum sheen, odors, or other evidence of possible groundwater contamination observed in the purge water. When product is present, the purge water will be collected for proper disposal. Otherwise, the purge water is recharged to the same aquifer within 20 feet of the well.

5. If a bailer was not used to purge the well, a clean PVC or stainless steel bailer, equipped with a teflon check valve and suspended by virgin polypropylene rope, is lowered into the well and rinsed three (3) times with the groundwater to be sampled. A sample is then retrieved for field measurements of the temperature, pH and specific conductance of the groundwater. Samples for laboratory analysis are collected with the bailer and transferred to appropriate sample containers. A separate, pre-cleaned bailer is employed for each monitoring well.

When sampling for volatile organic compounds (VOC), care is taken to avoid any unnecessary sample aeration. VOC samples are collected in EPA approved 40 ml. vials sealed with teflon lined septum caps. Care is taken to assure that no air bubbles are sealed within the vial.

When sampling for dissolved metals analyses, groundwater samples are filtered immediately, or as soon as possible, through clean 0.45 um membranes, transferred to clean polyethylene containers, and preserved with 1:1 reagent grade nitric acid to a pH less than 2. Only laboratory grade glass or polysulfone filter holders and receivers are used.

6. All sample containers are properly labeled, logged in on an ECS Chain of Custody Form, and immediately placed on ice for transport to the laboratory.
7. All sampling equipment (except for dedicated tubing when appropriate) is retrieved and the protective casing is secured.

Sample Container, Preservation, and Holding Time

Sample container, preservation, and holding time requirements for common sampling parameters is presented in Table 1.

Equipment Decontamination

To avoid sample cross-contamination, the following procedures are employed to properly decontaminate sampling equipment:

Bailers

Immediately after sampling the bailer is rinsed with clean potable tap water to remove the majority of the contaminants encountered and placed in a plastic bag for transport to the ECS facility. Once at ECS, each bailer is disassembled, soaked and thoroughly scrubbed with "Alconox" brand laboratory detergent, and rinsed finally with clean potable tap water. Each bailer is then allowed to air dry in a vertical position. When the bailer is to be used to collect a sample for dissolved metals analysis, the bailer is rinsed with reagent grade deionized water instead of tap water.

Field Filtering Equipment

All filtering equipment is decontaminated by washing with 10 percent reagent grade nitric acid followed by rinsing with deionized water between each sample.

Water Level Indicators

Water level indicators are decontaminated between wells by rinsing with clean water, washing with reagent grade methanol, and rinsing finally with clean water.

Surface Water Sampling Procedures

Surface water samples are collected in accordance with the protocols outlined below.

1. The desired sampling location is approached from downstream to avoid upstream disturbances which could result in the collection of unrepresentative samples.
2. Field measurements of the temperature, pH, and specific conductance of the water are made by directly submersing the appropriate instruments into the water stream. The results are recorded.
3. Completely submerge the appropriate sample containers to a depth of approximately 2/3 of the total depth of water measured up from the bottom of the stream, being careful to remain Downstream of the sample container with the opening facing upstream. After the containers have filled with water, remove, cap, and properly label each container.

Samples for VOC analysis are collected in EPA approved 40 ml. vials sealed with teflon lined septum caps. Care is taken to avoid any unnecessary sample aeration which could result in loss of volatile constituents, and to assure that on air bubbles are sealed within the vial.

TABLE 1
LIST OF SAMPLE CONTAINER, PRESERVATION,
AND HOLDING TIME REQUIREMENTS

PARAMETER	MEDIA	CONTAINER	PRESERVATIVE	HOLDING TIME
Volatile Organics	Water	3 40 ml glass vials with teflon lined septum caps	2 drops 1:1 HCl, cool 4°C	14 days
	Soil	2 40 ml glass vials with teflon lined septum caps	cool 4°C	14 days
Semi-Volatile Organics	Water	1 L amber glass bottle	cool 4°C	14 days
	Soil	8-oz. glass jars	cool 4°C	14 days
Total Petroleum Hydrocarbons	Water	1 L amber glass bottle	cool 4°C, HCl to pH < 2	14 days
	Soil	8-oz. glass jars	cool 4°C	14 days
Metals	Water	1 L plastic bottles	<u>Dissolved</u> - field filtration (0.45 micron), HNO ₃ pH < 2	6 months
			<u>Total</u> - HNO ₃ pH < 2, cool 4°C	
	Soil	8-oz. glass jars	cool 4°C	6 months
PCB's	Water	1 L amber glass bottle	cool 4°C	7 days (until extraction) 40 days (after extraction)
	Soil	8-oz. glass jars	cool 4°C	7 days (until extraction) 40 days (after extraction)
Pesticides	Water	1 L amber glass bottle	cool 4°C	7 days (until extraction) 40 days (after extraction)
	Soil	8-oz. glass jars	cool 4°C	7 days (until extraction) 40 days (after extraction)

Note: Sources:

- 1) "Standard References for Monitoring Wells", Massachusetts Department of Environmental Protection Publication # WSC-310-91, January, 1991.
- 2) Methods of chemical analysis of water and wastes, U.S. EPA 600/4-79-020, EMSL 1983.
- 3) Test methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. EPA SW-846, 1986.

Samples for total metals analyses are preserved immediately with 1:1 reagent grade nitric acid.

4. Log in each sample on the ECS Chain of Custody Form and place on ice for transport to the laboratory.



SPECTRUM ANALYTICAL, INC.

Massachusetts Certification M-MA 138
Connecticut Approval # PH 0777
Rhode Island # 98 & Maine # n/a
New Hampshire ID#253893
New York ID#11393

*ECS, Inc.
588 Silver Street
Agawam, MA 01001*

August 22, 1994

Attn: G. Riddle

Client Project No.: 12142

Location: Commercial Disposal - W.S.

<u>Lab ID No.</u>	<u>Client ID</u>	<u>Analysis Requested</u>
AA19729	MW-2	EPA 8240/624 TPH by GC (water)
AA19730	MW-3	EPA 8240/624 TPH by GC (water)
AA19731	MW-4	EPA 8240/624 TPH by GC (water)
AA19732	MW-5	EPA 8240/624 TPH by GC (water)
AA19733	TRIPBLNK	EPA 8240/624
AA19734	FIELD BNK	EPA 8240/624

Authorized by


Hanibal Tayeh
General Manager

ENVIRONMENTAL ANALYSES

588 Silver Street • Agawam, Massachusetts 01001 • 413-789-9018 • FAX 413-789-4076

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: MW-2
Lab ID No: AA19729

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Sampled on 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration, HCl
Container : 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Client

Volatile Organics

EPA Methods 624 / 8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	3.3	1	08/17/94	GM
Bromodichloromethane	Not detected	1	08/17/94	GM
Bromomethane	Not detected	1	08/17/94	GM
Bromoform	Not detected	1	08/17/94	GM
Carbon tetrachloride	Not detected	1	08/17/94	GM
Chlorobenzene	Not detected	1	08/17/94	GM
Chloroethane	Not detected	5	08/17/94	GM
Chloroform	Not detected	1	08/17/94	GM
Chloromethane	Not detected	5	08/17/94	GM
Dibromochloromethane	Not detected	1	08/17/94	GM
1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
1,3-Dichlorobenzene	Not detected	1	08/17/94	GM
1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
1,1-Dichloroethane	Not detected	1	08/17/94	GM
1,2-Dichloroethane	Not detected	1	08/17/94	GM
1,1-Dichloroethene	Not detected	1	08/17/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
1,2-Dichloropropane	Not detected	1	08/17/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
Ethylbenzene	Not detected	1	08/17/94	GM
Methylene chloride	Not detected	2.5	08/17/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/17/94	GM
Tetrachloroethene	5.4	1	08/17/94	GM
Toluene	Not detected	1	08/17/94	GM
1,1,1-Trichloroethane	1.3	1	08/17/94	GM
1,1,2-Trichloroethane	Not detected	1	08/17/94	GM
Trichloroethene	Not detected	1	08/17/94	GM
Trichlorofluoromethane	Not detected	1	08/17/94	GM
m,p-Xylenes	Not detected	2	08/17/94	GM
o-Xylene	6.7	1	08/17/94	GM
Vinyl chloride	Not detected	1	08/17/94	GM
Methyl-t-butyl ether	Not detected	1	08/17/94	GM
BFB Surrogate Recovery (%)	97		08/17/94	GM
p-DFB Surrogate Recovery (%)	100		08/17/94	GM
CLB-d5 Surrogate Recovery (%)	98		08/17/94	GM

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: MW-3
Lab ID No: AA19730

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Sampled on 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration, HCl
Container : 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Client

Volatile Organics

EPA Methods 624 / 8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/17/94	GM
Bromodichloromethane	Not detected	1	08/17/94	GM
Bromomethane	Not detected	1	08/17/94	GM
Bromoform	Not detected	1	08/17/94	GM
Carbon tetrachloride	Not detected	1	08/17/94	GM
Chlorobenzene	Not detected	1	08/17/94	GM
Chloroethane	Not detected	5	08/17/94	GM
Chloroform	Not detected	1	08/17/94	GM
Chloromethane	Not detected	5	08/17/94	GM
Dibromochloromethane	Not detected	1	08/17/94	GM
1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
1,3-Dichlorobenzene	Not detected	1	08/17/94	GM
1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
1,1-Dichloroethane	Not detected	1	08/17/94	GM
1,2-Dichloroethane	Not detected	1	08/17/94	GM
1,1-Dichloroethene	Not detected	1	08/17/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
1,2-Dichloropropane	Not detected	1	08/17/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
Ethylbenzene	Not detected	1	08/17/94	GM
Methylene chloride	Not detected	2.5	08/17/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/17/94	GM
Tetrachloroethene	2.8	1	08/17/94	GM
Toluene	Not detected	1	08/17/94	GM
1,1,1-Trichloroethane	3.4	1	08/17/94	GM
1,1,2-Trichloroethane	Not detected	1	08/17/94	GM
Trichloroethene	Not detected	1	08/17/94	GM
Trichlorofluoromethane	Not detected	1	08/17/94	GM
m,p-Xylenes	Not detected	2	08/17/94	GM
o-Xylene	Not detected	1	08/17/94	GM
Vinyl chloride	Not detected	1	08/17/94	GM
Methyl-t-butyl ether	3.2	1	08/17/94	GM
BFB Surrogate Recovery (%)	105		08/17/94	GM
p-DFB Surrogate Recovery (%)	103		08/17/94	GM
CLB-d5 Surrogate Recovery (%)	102		08/17/94	GM

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: MW-4
Lab ID No: AA19731

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Sampled on 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration, HCl
Container : 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Client

Volatile Organics

EPA Methods 624 / 8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/18/94	GM
Bromodichloromethane	Not detected	1	08/18/94	GM
Bromomethane	Not detected	1	08/18/94	GM
Bromoform	Not detected	1	08/18/94	GM
Carbon tetrachloride	Not detected	1	08/18/94	GM
Chlorobenzene	Not detected	1	08/18/94	GM
Chloroethane	Not detected	5	08/18/94	GM
Chloroform	Not detected	1	08/18/94	GM
Chloromethane	Not detected	5	08/18/94	GM
Dibromochloromethane	Not detected	1	08/18/94	GM
1,2-Dichlorobenzene	Not detected	1	08/18/94	GM
1,3-Dichlorobenzene	Not detected	1	08/18/94	GM
1,4-Dichlorobenzene	Not detected	1	08/18/94	GM
1,1-Dichloroethane	Not detected	1	08/18/94	GM
1,2-Dichloroethane	Not detected	1	08/18/94	GM
1,1-Dichloroethene	Not detected	1	08/18/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/18/94	GM
1,2-Dichloropropane	Not detected	1	08/18/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/18/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/18/94	GM
Ethylbenzene	Not detected	1	08/18/94	GM
Methylene chloride	Not detected	2.5	08/18/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/18/94	GM
Tetrachloroethene	11	1	08/18/94	GM
Toluene	Not detected	1	08/18/94	GM
1,1,1-Trichloroethane	6.5	1	08/18/94	GM
1,1,2-Trichloroethane	Not detected	1	08/18/94	GM
Trichloroethene	Not detected	1	08/18/94	GM
Trichlorofluoromethane	Not detected	1	08/18/94	GM
m,p-Xylenes	Not detected	2	08/18/94	GM
o-Xylene	Not detected	1	08/18/94	GM
Vinyl chloride	Not detected	1	08/18/94	GM
Methyl-t-butyl ether	Not detected	1	08/18/94	GM
BFB Surrogate Recovery (%)	99		08/18/94	GM
p-DFB Surrogate Recovery (%)	101		08/18/94	GM
CLB-d5 Surrogate Recovery (%)	101		08/18/94	GM

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: MW-5
Lab ID No: AA19732

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Sampled on 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration, HCl
Container : 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Client

Volatile Organics

EPA Methods 624 / 8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/19/94	GM
Bromodichloromethane	Not detected	1	08/19/94	GM
Bromomethane	Not detected	1	08/19/94	GM
Bromoform	Not detected	1	08/19/94	GM
Carbon tetrachloride	Not detected	1	08/19/94	GM
Chlorobenzene	Not detected	1	08/19/94	GM
Chloroethane	Not detected	5	08/19/94	GM
Chloroform	Not detected	1	08/19/94	GM
Chloromethane	Not detected	5	08/19/94	GM
Dibromochloromethane	Not detected	1	08/19/94	GM
1,2-Dichlorobenzene	Not detected	1	08/19/94	GM
1,3-Dichlorobenzene	Not detected	1	08/19/94	GM
1,4-Dichlorobenzene	Not detected	1	08/19/94	GM
1,1-Dichloroethane	1.4	1	08/19/94	GM
1,2-Dichloroethane	Not detected	1	08/19/94	GM
1,1-Dichloroethene	Not detected	1	08/19/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/19/94	GM
1,2-Dichloropropane	Not detected	1	08/19/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/19/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/19/94	GM
Ethylbenzene	Not detected	1	08/19/94	GM
Methylene chloride	Not detected	2.5	08/19/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/19/94	GM
Tetrachloroethene	34	1	08/19/94	GM
Toluene	Not detected	1	08/19/94	GM
1,1,1-Trichloroethane	Not detected	1	08/19/94	GM
1,1,2-Trichloroethane	Not detected	1	08/19/94	GM
Trichloroethene	9.5	1	08/19/94	GM
Trichlorofluoromethane	Not detected	1	08/19/94	GM
m,p-Xylenes	Not detected	2	08/19/94	GM
o-Xylene	Not detected	1	08/19/94	GM
Vinyl chloride	Not detected	1	08/19/94	GM
Methyl-t-butyl ether	Not detected	1	08/19/94	GM
BFB Surrogate Recovery (%)	109		08/19/94	GM
p-DFB Surrogate Recovery (%)	103		08/19/94	GM
CLB-d5 Surrogate Recovery (%)	105		08/19/94	GM

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: TRIPBLNK
Lab ID No: AA19733

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Sampled on 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration, HCl
Container : 1 VOA Vial
Condition of Sample as Received: Satisfactory
Delivered by: Client

Volatile Organics

EPA Methods 624 / 8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/17/94	GM
Bromodichloromethane	Not detected	1	08/17/94	GM
Bromomethane	Not detected	1	08/17/94	GM
Bromoform	Not detected	1	08/17/94	GM
Carbon tetrachloride	Not detected	1	08/17/94	GM
Chlorobenzene	Not detected	1	08/17/94	GM
Chloroethane	Not detected	5	08/17/94	GM
Chloroform	Not detected	1	08/17/94	GM
Chloromethane	Not detected	5	08/17/94	GM
Dibromochloromethane	Not detected	1	08/17/94	GM
1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
1,3-Dichlorobenzene	Not detected	1	08/17/94	GM
1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
1,1-Dichloroethane	Not detected	1	08/17/94	GM
1,2-Dichloroethane	Not detected	1	08/17/94	GM
1,1-Dichloroethene	Not detected	1	08/17/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
1,2-Dichloropropane	Not detected	1	08/17/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
Ethylbenzene	Not detected	1	08/17/94	GM
Methylene chloride	Not detected	2.5	08/17/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/17/94	GM
Tetrachloroethene	Not detected	1	08/17/94	GM
Toluene	Not detected	1	08/17/94	GM
1,1,1-Trichloroethane	Not detected	1	08/17/94	GM
1,1,2-Trichloroethane	Not detected	1	08/17/94	GM
Trichloroethene	Not detected	1	08/17/94	GM
Trichlorofluoromethane	Not detected	1	08/17/94	GM
m,p-Xylenes	Not detected	2	08/17/94	GM
o-Xylene	Not detected	1	08/17/94	GM
Vinyl chloride	Not detected	1	08/17/94	GM
Methyl-t-butyl ether	Not detected	1	08/17/94	GM
BFB Surrogate Recovery (%)	104		08/17/94	GM
p-DFB Surrogate Recovery (%)	103		08/17/94	GM
CLB-d5 Surrogate Recovery (%)	100		08/17/94	GM

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: FIELD BNK
Lab ID No: AA19734

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Sampled on 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration, HCl
Container : 1 VOA Vial
Condition of Sample as Received: Satisfactory
Delivered by: Client

Volatile Organics

EPA Methods 624 / 8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/17/94	GM
Bromodichloromethane	Not detected	1	08/17/94	GM
Bromomethane	Not detected	1	08/17/94	GM
Bromoform	Not detected	1	08/17/94	GM
Carbon tetrachloride	Not detected	1	08/17/94	GM
Chlorobenzene	Not detected	1	08/17/94	GM
Chloroethane	Not detected	5	08/17/94	GM
Chloroform	Not detected	1	08/17/94	GM
Chloromethane	Not detected	5	08/17/94	GM
Dibromochloromethane	Not detected	1	08/17/94	GM
1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
1,3-Dichlorobenzene	Not detected	1	08/17/94	GM
1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
1,1-Dichloroethane	Not detected	1	08/17/94	GM
1,2-Dichloroethane	Not detected	1	08/17/94	GM
1,1-Dichloroethene	Not detected	1	08/17/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
1,2-Dichloropropane	Not detected	1	08/17/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
Ethylbenzene	Not detected	1	08/17/94	GM
Methylene chloride	Not detected	2.5	08/17/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/17/94	GM
Tetrachloroethene	Not detected	1	08/17/94	GM
Toluene	Not detected	1	08/17/94	GM
1,1,1-Trichloroethane	Not detected	1	08/17/94	GM
1,1,2-Trichloroethane	Not detected	1	08/17/94	GM
Trichloroethene	Not detected	1	08/17/94	GM
Trichlorofluoromethane	Not detected	1	08/17/94	GM
m,p-Xylenes	Not detected	2	08/17/94	GM
o-Xylene	Not detected	1	08/17/94	GM
Vinyl chloride	Not detected	1	08/17/94	GM
Methyl-t-butyl ether	Not detected	1	08/17/94	GM
BFB Surrogate Recovery (%)	96		08/17/94	GM
p-DFB Surrogate Recovery (%)	100		08/17/94	GM
CLB-d5 Surrogate Recovery (%)	100		08/17/94	GM

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: MW-3
Lab ID No: AA19730

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Collected: 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration
Container : 1 Amber Glass Liter
Condition of Sample as Received: Satisfactory
Delivered by: Client

Total Hydrocarbons by GC
Modified EPA Method 8100

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected		08/18/94	08/21/94	TG
Fingerprint based quantification:					
Gasoline	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #2	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #4	Not detected	0.7	08/18/94	08/21/94	TG
Fuel Oil #6	Not detected	0.7	08/18/94	08/21/94	TG
Motor Oil	Not detected	0.7	08/18/94	08/21/94	TG
Ligroin	Not detected	0.4	08/18/94	08/21/94	TG
Aviation Fuel	Not detected	0.4	08/18/94	08/21/94	TG
Other Oil	Not detected	0.7	08/18/94	08/21/94	TG
Unidentified	Not detected		08/18/94	08/21/94	TG

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

- Gasoline - includes regular, unleaded, premium, etc.
- Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.
- Fuel Oil #4 - Includes #4 Fuel Oil.
- Fuel Oil #6 - includes #6 oil and bunker "C" oil.
- Motor Oil - includes virgin and waste automobile.
- Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.
- Aviation Fuels - includes Kerosene, Jet A and JP-4.
- Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A * in the results column indicates the petroleum calibration used to quantify unidentified samples.

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: MW-4
Lab ID No: AA19731Location: Commercial Disposal - W.S.
Client Job No.: 12142Matrix: Water
Collected: 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HTPreservative: Refrigeration
Container : 1 Amber Glass Liter
Condition of Sample as Received: Satisfactory
Delivered by: Client**Total Hydrocarbons by GC**
Modified EPA Method 8100

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected		08/18/94	08/21/94	TG
Fingerprint based quantification:					
Gasoline	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #2	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #4	Not detected	0.7	08/18/94	08/21/94	TG
Fuel Oil #6	Not detected	0.7	08/18/94	08/21/94	TG
Motor Oil	Not detected	0.7	08/18/94	08/21/94	TG
Ligroin	Not detected	0.4	08/18/94	08/21/94	TG
Aviation Fuel	Not detected	0.4	08/18/94	08/21/94	TG
Other Oil	Not detected	0.7	08/18/94	08/21/94	TG
Unidentified	Not detected		08/18/94	08/21/94	TG

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A * in the results column indicates the petroleum calibration used to quantify unidentified samples.

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: MW-5
Lab ID No: AA19732

Location: Commercial Disposal - W.S.
Client Job No.: 12142

Matrix: Water
Collected: 08/09/94 by R. HAYNES/ECS
Received on 08/09/94 by ATO
QC and Data Review by HT

Preservative: Refrigeration
Container : 1 Amber Glass Liter
Condition of Sample as Received: Satisfactory
Delivered by: Client

Total Hydrocarbons by GC
Modified EPA Method 8100

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected		08/18/94	08/21/94	TG
Fingerprint based quantification:					
Gasoline	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #2	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #4	Not detected	0.7	08/18/94	08/21/94	TG
Fuel Oil #6	Not detected	0.7	08/18/94	08/21/94	TG
Motor Oil	Not detected	0.7	08/18/94	08/21/94	TG
Ligroin	Not detected	0.4	08/18/94	08/21/94	TG
Aviation Fuel	Not detected	0.4	08/18/94	08/21/94	TG
Other Oil	Not detected	0.7	08/18/94	08/21/94	TG
Unidentified	Not detected		08/18/94	08/21/94	TG

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A * in the results column indicates the petroleum calibration used to quantify unidentified samples.

Spectrum Analytical, Inc.
Laboratory Report Supplement

References

Methods for the Determination of Organic Compounds in Drinking Water. EPA-600/4-88/039. EMSL 1988.

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. EMSL 1983.

Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. EPA 600/4-82-057. EMSL 1982.

Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846. 1986.

Standard Methods for the Examination of Water and Wastes. APHA-AWWA-WPCF. 16th Edition. 1985.

Standard Methods for Comparison of Waterborne Petroleum Oils by Gas Chromatography. ASTM D 3328. 1982.

Oil Spill Identification System. U.S. Coast Guard CG-D-52-77: 1977.

Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. EMSL 1979.

Choosing Cost-Effective QA/QC (Quality Assurance/Quality Control) Programs for Chemical Analyses. EPA 600/4-85/056. EMSL 1985.

Report Notations

Not Detected, Not Det, ND or nd	=	<i>The compound was not detected at a concentration equal to or above the established method detection limit.</i>
NC	=	<i>Not Calculated</i>
VOA	=	<i>Volatile Organic Analysis</i>
BFB	=	<i>4-Bromofluorobenzene (an EPA 624 Surrogate)</i>
p-DFB	=	<i>1,4-Difluorobenzene (an EPA 624 Surrogate)</i>
CLB-d5	=	<i>Chlorobenzene-d5 (an EPA 624 Surrogate)</i>
BCP	=	<i>2-Bromo-1-chloropropane (an EPA 601 Surrogate)</i>
TFT	=	<i>a,a,a-Trifluorotoluene (an EPA 602 Surrogate)</i>

Definitions

Surrogate Recovery = The recovery (expressed as a percent) of a non method analyte (see surrogates listed above) added to the sample for the purpose of monitoring system performance.

Matrix Spike Recovery = The recovery (expressed as a percent) of method analytes added to the sample for the purpose of determining any effect of sample composition on analyte recovery.

Laboratory Replicate = Two sample aliquots taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of laboratory duplicates give a measure of the precision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

Field Duplicate = Two separate samples collected at the same time and place under identical circumstances and treated exactly the same throughout field and laboratory procedures. Analysis of Field duplicates give a measure of the precision associated with sample collection, preservation and storage, as well as with laboratory procedures.

Relative Percent Difference (%RPD) = The precision measurement obtained on duplicate/replicate analyses. %RPD is calculated as:

$$\%RPD = \frac{|\text{value1} - \text{value2}|}{\text{ave. value}} * 100\%$$



CHAIN OF CUSTODY RECORD

588 Silver Street
Agawam, MA 01001

Tel. (413) 789-9018
FAX (413) 789-4076

REPORTS TO: <u>ECS</u>	INVOICE TO: <u>ECS</u>
PROJECT No: <u>12142</u>	P.O. No:
PROJECT Mgr: <u>G.R.</u>	SAMPLER(s): <u>ROB HAYNES</u>
SITE LOCATION: <u>COMMERCIAL DISPOSAL U.S.</u>	

SAMPLE TYPE & MATRIX CODES:							CONTAINERS				ORGANICS				METALS		OTHER			
1=4°C 2=HCl 3=H ₂ SO ₄ 4=HNO ₃ 5= OTHER _____							# 40 ml VOA VIALS	# OF AMBER GLASS LITERS	# OF PLASTIC LITERS	# OF GLASS SOIL JARS	<input type="checkbox"/> 601 <input type="checkbox"/> 8010	<input type="checkbox"/> 602 <input type="checkbox"/> 8020	<input type="checkbox"/> 502.2 <input type="checkbox"/> 524.2	<input type="checkbox"/> 8260 <input type="checkbox"/> 8270	<input type="checkbox"/> HSL <input type="checkbox"/> MTBE	<input type="checkbox"/> SOLUBLE <input type="checkbox"/> TOTAL <input type="checkbox"/> TCLP	<input type="checkbox"/> RCRA 8 <input type="checkbox"/> PP13	DEPTH by GC <input type="checkbox"/> FINGERPRINT	DEPTH by IR <input type="checkbox"/> OIL&GREASE	<input type="checkbox"/> 610 <input type="checkbox"/> 608
LAB USE ONLY	SAMPLE I.D.	DATE	TIME	MATRIX	SAMPLE TYPE	PRESERVATIVE														
19729	MW-2	8-9-94	1:40	1	G	12	2	1												
30	MW-3	8-9-94	2:00	1	G	12	2	1												
31	MW-4	8-9-94	1:50	1	G	12	2	1												
32	MW-5	8-9-94	1:30	1	G	12	2	1												
33	TRIP BLANK	8-9-94	11:30	1	G	12	1													
34	FIELD BLANK	8-9-94	1:55	1	G	12	1													

RELINQUISHED BY: <u>Robert Haynes</u>	RECEIVED BY: <u>A. Prady</u>	DATE <u>8-9-94</u>	TIME <u>1545</u>
--	---------------------------------	-----------------------	---------------------

SPECIAL INSTRUCTIONS:	SPECIAL HANDLING: <input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> 7 BUS. DAYS <input type="checkbox"/> RUSH 24 HOURS DATE RESULTS NEEDED: <u>8-23-94</u>
-----------------------	--

LIMITATIONS

- 1) The findings set forth in the site assessment report are strictly limited in time and scope to the date of the evaluation, and such findings shall not be used by any one other than client and shall not apply prospectively, and shall not be used for any other purpose than that set forth herein.
- 2) This report contains recommendations which are partially based on the analysis of data accumulated at the time and place set forth in the report through subsurface exploration. However, further investigations may reveal additional data or variations of the current data which may require the enclosed recommendations to be reevaluated.
- 3) The site assessment report provided by Environmental Compliance Services, Inc. herein has made certain interpretations of water level readings in the observation wells at the specific times and under currently existing conditions. This report has summarized these times and conditions, the interpretation, and presents appropriate modifications.
- 4) This report reflects chemical analysis for a practical number of specific parameters which have been previously expressed. However, the report does not express the possible presence of other constituents in the soil and groundwater chemical analysis.
- 5) This report has been prepared in accordance with generally accepted hydrogeologic practices and exclusively for client. No other warranty, express or implied, is made.



ENVIRONMENTAL COMPLIANCE SERVICES, Inc.

ENVIRONMENTAL SITE ASSESSMENT
115 WAYSIDE AVENUE
WEST SPRINGFIELD, MASSACHUSETTS

Prepared For:

Mr. Robb Townsend
Trailerworks, Inc.
13 South Bridge Drive
Agawam, Massachusetts,

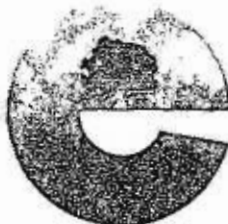
File No. 13997
Document No. 18944
August, 2000

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ENVIRONMENTAL COMPLIANCE SERVICES, INC.

August 11, 2000
File No. 13997.00
Document No. 18944

Mr. Robb Townsend
Trailerworks, Inc.
13 South Bridge Drive
Agawam, MA. 01001-0506

RE: Environmental Site Assessment
115 Wayside Avenue
West Springfield, Massachusetts

Dear Mr. Townsend:

Environmental Compliance Services, Inc. (ECS) has completed an Environmental Site Assessment of the commercial property at 115 Wayside Avenue in West Springfield, Massachusetts (the site) (Figure 1, Site Locus). This assessment included: background research at the West Springfield City Offices, West Springfield Fire Department; a review of state and federal environmental databases and files regarding the site and surrounding properties; review of available documentation regarding closure of the site as a Resource Conservation and Recovery Act (RCRA) Transfer, Disposal, Storage Facility (TSDF); and soil and groundwater sampling and analyses. The purpose of this assessment was to render an opinion as to the presence of oil and/or hazardous materials at the site within the provisions of Massachusetts General Laws (MGL) Chapter 21E the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, and the applicable implementing regulations.

The Site Locus and Site Plan are included as Figure 1 and Figure 2, respectively. Documentation of information gathered as part of this assessment is presented in Attachment I. The New England Data Map report is included as Attachment II. ECS Protocols are included as Attachment III, Soil boring logs as Attachment IV, Groundwater Sampling logs Attachment V, and Laboratory Certificates of soil and groundwater results as Attachment VI. A summary of the findings of the assessment, as well as conclusions and recommendations, are presented within.



ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Mr. Robb Townsend
Trailerworks, Inc.
August 11, 2000

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1.00 - SUMMARY

1.10 - Location Description and Setting

The site consists of approximately 2.13 acres of land located approximately 750 feet west of the Connecticut River at the intersection of Wayside Avenue and Town Way in West Springfield, Massachusetts (the site) (Site Locus, Figure 1). The property is listed at the West Springfield Assessor's Office as Parcel Code 499 on Map 81, owned by Commercial Disposal with Waste Management as the parent company. The site is located in a commercial and industrial area with some residential properties located in the vicinity of the site.

Two buildings are located on the site. The building and site are currently vacant but formerly used for the present building, consisting of approximately 14,100 square feet of floor space, is office, warehouse and garage for garage. Utilities available on the site include natural gas, electrical and telephone services, and municipal sanitary sewer and drinking water supply. Surface drainage flows either to a storm drain on-site and abutting roadways toward a drainage pipe that discharges to the north of the site parking areas or into a Connecticut River overflow detention basin located to the north of the site.

Abutting properties include: Capital Insulation to the west; West Springfield flood control property to the north; Bearings Specialty Co., Northeast Precision, A&M Compressed Air Products, Computerland and a residential house located to the south; and Town Way located to the east (Site Plan, Figure 2).

The topography of the site slopes gently from the west down towards the east. A topographic depression associated with a Connecticut River Overflow basin is located directly to the northeast of the site.

1.20 - History of Development

According to available historical records, the site has occupied by Commercial Disposal since the mid 1980's. In February 1996 United Waste purchased Commercial Disposal. In August 1997 USA Waste purchased United Waste. In July 1998 Waste Management purchased USA Waste. Waste Management is the parent company of Commercial Disposal which is still exists and is listed as the owner. Prior to that time the site was occupied by Capital Insulation in the 1970s and New England Roto engraving in the 1960s and 1970s. The easterly portion of the site along Town Way formerly supported Legers Rubbish Removal Corp. Division of Waste



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Trailerworks, Inc.
August 11, 2000

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Management in the 1960s and 1970s. No on-site development was documented prior to the 1960s.

The area of the site was developed for residential use prior to 1930 and remained residential in nature until the 1950s. The southerly abutter at 121 and 123 Wayside Avenue remains as a residential property. Other properties abutting the site have supported commercial and industrial businesses since the 1950s.

1.30 - REGULATORY INFORMATION

1.31 - On-Site

A review of a New England DataMap Corporation report, (Attachment II) and files available at the Western Regional Office of the Massachusetts Department of Environmental Protection (DEP), City of West Springfield Fire Department, and West Springfield City Clerk's Office records revealed the following information:

- The site was formerly a Transport, Storage or Disposal Facility (TSDF) as defined by 310 CMR 30.00 Resource Conservation and Recovery Act (RCRA). Storage of hazardous waste on the site was discontinued in 1987.

The facility underwent a RCRA closure study performed by HRP Associates Inc. of Plainville Connecticut. Based on the study a closure certification and change of status form were filed by Commercial Disposal in July 1993. The closure study included the removal of above ground hazardous waste storage tanks and removal of soil from a hazardous waste drum storage area. This area is designated as a previously excavated area on the Site Plan, Figure 2. Groundwater monitoring wells were installed on the site and groundwater samples were obtained for quantitative analyses. Several chlorinated solvents were detected in groundwater on the site.

On January 25, 1994 a letter indicating that the closure satisfied the requirements of 310 CMR 30.587 was issued by the Massachusetts Department of Environmental Protection, Boston, Massachusetts. The letter indicated that no post closure requirements were imposed by the DEP. Groundwater contamination, however, was detected on the site and the letter indicated that the groundwater contamination should be compared to the standards of the



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Massachusetts Contingency Plan 310 CMR 40.0000.

- The site is not listed on the U.S. EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list, or on the DEP's List of Confirmed Disposal Sites or Locations to be Investigated (LTBI).
- The site was a small quantity generator of waste oil. According to a May 24, 1993 Compliance Inspection of the site, a waste-oil space heater is permitted for use to burn up to 2,000 gallons of waste oil per year on the site. Approximately 1,650 gallons of waste oil were burned on site for heating. The waste oil material is stored in a 250-gallon above ground storage tank. According to the file two parts cleaners are used on site and utilize naphtha for cleaning solvent. No floor drains or wastewater discharges were noted in the area of the waste-oil burner.
- Emergency Response incident reports regarding the site indicate that approximately 30 gallons of diesel fuel was spilled at the site on December 1, 1992. The spill was cleaned by Oil Recovery of West Springfield, MA. The DEP closed this case on December 4, 1992. On July 22, 1993, 20 to 50 gallons of hydraulic oil was released to the site from a hydraulic line on a dump truck. The file indicates that approximately 1.73 tons of absorbent material was used to cleanup this spill. Also, on October 21, 1994, approximately 3 gallons of fuel oil was spilled from an oil delivery truck and on April 30 1986 approximate 5 gallons of diesel was spilled during an overfill of a storage tank. These spills were covered with absorbent and cleaned up by Commercial Disposal.
- One 10,000 gallon underground storage tank on the site failed a tank test in April 1986. The tank was retested and passed the second tank test. The failure of the testing was attributed to an air pressure loss from a manhole which had not been considered.
- Fire department records indicate that the site is currently equipped with (2) 1,000 gallon and (1) 10,000 gallon underground storage tanks. The 1,000 gallon tanks contain hydraulic oil and lubricating oil and the 10,000 gallon tank contains diesel fuel. These tanks were installed in 1989. Tanks with an approximately capacity of 14,000 gallons were removed from the site in 1988 and 1989. No indication of a release from these tanks was noted in fire department files.



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Trailerworks, Inc.
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- A review of the DEP/Mass GIS Map for Natural Resources/Western Region indicated that the site and vicinity are mapped as an area underlain by a medium-yield aquifer which is considered potentially productive. No public water supply is located in the vicinity of the site.

1.32 - Off-Site

There are no locations within a one-mile radius of the site which appear on the USEPA CERCLIS list.

There are two locations in the immediate vicinity of the site that are on the DEP's Transitioned and Tier Classified Sites. Former Sanford Tool at 79 Wayside Avenue and property located at 35 Doty Circle both located approximately 200 feet west of the site. (Attachment I).

Leaking underground storage tank incidents have occurred at the UPS facility to the south of the site across Wayside Avenue and at 124 Ashley Avenue which is approximately 0.3 of a mile to the south of the site. No emergency response incidents were indicated on abutting sites. The UPS facility across Wayside Avenue had a release to floor drains on their property which discharged to the Connecticut River (Attachment I).

Brinks at 35 Doty Circle, Standard Industrial Supply 154 Wayside Avenue and UPS at 120 Wayside Avenue have been licensed for underground storage tanks.

1.40 - Site Visit

The site visit was performed by Mr. Karl M. Dietzler on July 31, 2000. The following general observations were made during the site visit:

- The on-site buildings are comprised of a one-story concrete block office building and a one-story maintenance garage building. The site buildings were recently occupied by Waste Management/Commercial Disposal. Trucks associated with the solid waste transporting were parked on the northeastern portion of the site.
- A paved parking area is located to the east of the office building and the majority of the site is either paved or covered by buildings.



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Trailerworks, Inc.
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- The current heating method utilized for the office building was natural gas. Natural gas was also used to fuel the heating system in the garage building and was supplemented by a waste oil-burning heater for which the DEP has issued a permit. Waste oil generated from the maintenance of vehicles on the site was stored and burned in bay 6 as depicted on the site plan, Figure 2.
- Oils and hazardous materials related to the businesses were stored on site inside the building area (Attachment I). Sanitary waste generated on the site was discharged to the municipal sewer system. Floor drains within the site building discharge to an oil/water separator, which is connected to the municipal sewer system.

2.00 - FIELD INVESTIGATIONS

2.10 - Investigatory Approach

Four of five groundwater monitoring wells located on or near the site were accessed, sampled and samples were analyzed to evaluate the potential presence of oil or hazardous material in the environment of the site. A fifth monitoring well, designated MW-5 could not be located by ECS. Previous investigations indicated that these sampling locations are downgradient to potential sources of oil or hazardous material on the site. The locations of monitoring wells were approximated from available information on the Site Plan, Figure 2.

Several soil borings were completed on the site to address potential sources of contamination. Borings EP-2 through EP-4 and EP-9 were situated in the vicinity of an active 10,000 gallon diesel UST. Borings EP-5 through EP-7 were situated in the vicinity of (2) 1,000 gallon USTs. Boring EP-8 was situated in the vicinity of an oil/water separator.

2.20 - Methodology

2.21 - Drilling Procedures and Subsurface Sampling

Soil borings on July 25 and 28, 2000 were advanced by using a truck-mounted, hydraulically assisted probe-system. Soil samples were collected at designated intervals by direct push methods using a clean, decontaminated, 48-inch long nickel-plated sampler containing a dedicated 1.50-inch diameter PETG clear plastic liner. The liner was



ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Mr. Robb Townsend
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August 11, 2000

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removed from the sampler and cut open in the field with a decontaminated knife for sample screening and collection. Soil samples were visually characterized, logged, and examined for abnormalities indicative of contamination as would be evidenced by an unusual odor, texture, or color. Representative portions of each soil sample were collected in duplicate 8-ounce glass jars with an aluminum-foil seal placed beneath the screw cap for field screening for the presence of Total Organic Vapors (TOVs) in headspace. Boring logs are included in Attachment IV.

2.22 – Soil Screening Procedures

Soil samples were screened for TOVs using an H-Nu Systems Photoionization Organic Vapor Detector Model PI-101 equipped with a 10.2 eV lamp (calibrated as benzene). The method detection limit of the instrument is 0.2 parts per million (ppm). The probe of the instrument was inserted through the aluminum foil seal on the soil jars for headspace vapor screening after permitting development and equilibration of the sample at ambient temperatures. Soil screening protocols are presented in Attachment III. Based upon the results of TOVs, three subsurface soil samples were submitted for quantitative laboratory analysis.

2.23 - Groundwater Sampling

On July 24 and August 8, 2000, monitoring wells were gauged for depth to water and total depth using a decontaminated electronic water level indicator. The volume of standing water in each well was calculated and between three and five well volumes of groundwater were purged from each well using low flow sampling techniques on July 24, 2000 and using pre-wrapped, disposable plastic bailers suspended with virgin polypropylene rope on August 8, 2000. Groundwater samples were collected in duplicate 40 milliliter (ml) teflon-septa vials for Volatile Petroleum Hydrocarbon (VPH) and volatile halocarbon analysis, and in one liter glass containers for Extractable Petroleum Hydrocarbon (EPH) analysis. All samples were collected and submitted in accordance with MADEP and modified USEPA methodologies. These analyses were selected due to past property uses. Samples collected for VPH and EPH analyses were preserved with concentrated hydrochloric acid to achieve a pH less than 2 in the sample. All samples were refrigerated on-site and during transport to a Massachusetts-certified laboratory following chain of custody protocol.



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Trailerworks, Inc.
August 11, 2000

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A sample from each monitoring well was collected for on-site measurement of temperature, pH, and specific conductance, and to permit observation of pertinent characteristics such as the presence of an odor or a sheen (Groundwater Sampling Logs Attachment V).

2.30 - Results and Discussion

2.31 - Soil Screening Results

Significant levels of TOVs were encountered in soil samples collected from soil borings EP-2, EP-4 and EP-9 which were located on the south and east side of the 10,000 gallon UST.

TOVs in EP-2 ranged from 1,300 parts per million (ppm) in the 6-8' interval to 0.2 ppm in the 0-2' interval.

TOVs in EP-4 ranged from 100 ppm in the 2-4' interval to 1.2 ppm in the 8-10' interval.

TOVs in EP-9 ranged from 170 ppm in the 2-4' interval to Below Detectable Levels (BDL=<0.2ppm) in the 14-16' interval.

2.32 - Quantitative Soil Results

Soil samples were submitted from borings EP-9 (12-14'), EP-2 (6-8'), and EP-4 (2-4') for VPH and EPH analysis. Concentrations of VPH (C9-C10 aromatics) and VPH target analytes (naphthalene) were detected above in EP-9 (12-14') above Reportable Concentrations according to the Massachusetts Contingency Plan (MCP-310 CMR 40.1600) for category RCS-1, applicable to the site.

Concentrations of VPH (C5-C8 aliphatics and C9-C10 aromatics), VPH target analytes (naphthalene), EPH (C9-C18 aliphatics and C11-C22 aromatics), and EPH target PAH analytes (naphthalene and 2-methylnaphthalene) were detected in EP-2 (6-8') above RCS-1 standards.

Concentrations of VPH target analytes (naphthalene) were detected in EP-4 (2-4') above RCS-1 Standards.



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Mr. Robb Townsend
Trailerworks, Inc.
August 11, 2000

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Soil results are summarized in Table 1 are included in Attachment VI.

2.33 – Quantitative Groundwater Results

Detectable concentrations of Tetrachloroethene were present in the groundwater samples collected from wells MW-2 and MW-4. Concentrations in both wells were 1.4 micrograms per liter (ug/L), well below the RCGW-2 standard of 3,000 ug/L.

No concentrations of volatile hydrocarbons were detected in wells MW-1 and MW-3. No concentrations of VPH, VPH target analytes, EPH or EPH target PAH analytes were detected in MW-1, MW-2, MW-3, and MW-4.

3.00 CONCLUSIONS & RECOMMENDATIONS

3.10 – Conclusions

During this environmental site assessment, no evaluation of the presence of lead paint, urea formaldehyde foam insulation, or asbestos containing materials was performed on the site. A limited program of groundwater sampling and analyses was performed on the site to assess the condition of the site with respect to oil or hazardous material. Groundwater samples were obtained from monitoring wells installed by others as part of a previous study. The conclusions made in this report are limited according to these qualifications.

Based on the information obtained during this assessment, it is the opinion of ECS that soil contamination is present on the site in the vicinity of a 10,000 gallon diesel UST. Contaminants detected in soil exceed RCS-1 Standards and therefore trigger a 120 day reporting requirement to the DEP. The groundwater concentrations of tetrachloroethene in monitoring wells MW-2 and MW-4 are well below the RCGW-2 standards applicable for the subject site.

No other areas of concern were identified during the performance of this assessment.

3.20 – Recommendations

ECS recommends the excavation of proper disposal of contaminated soils in the immediate vicinity of the 10,000 gallon diesel UST. These activities will most likely trigger DEP notification before the 120 day requirement and warrant UST removal.



ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Mr. Robb Townsend
Trailerworks, Inc.
August 11, 2000

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If there are any questions concerning this information, please do not hesitate to contact our office.

Sincerely,
ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Karl M. Dietzler
Environmental Analyst

Mark A. Haynes
Senior Project Manager

KMD/MAH/kb
Attachments

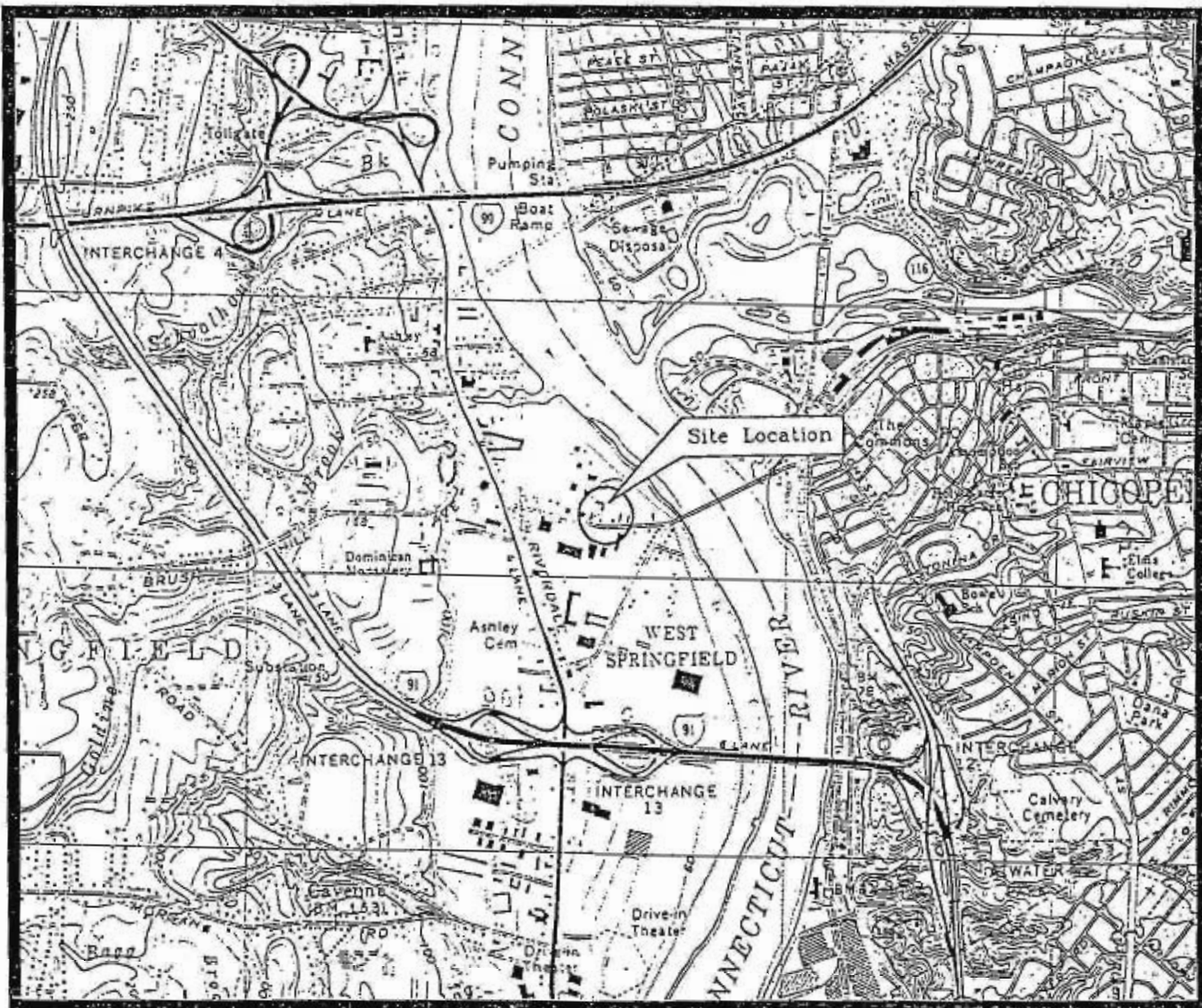
FIGURES



ENVIRONMENTAL COMPLIANCE SERVICES, INC.

588 Silver Street • Agawam, MA 01001

Brattleboro, VT • Brighton, MA • Brandon, FL • Madison, CT



Scale 1 : 25,000



Contour Interval 10 Feet

Base Map: U.S. Geological Survey; Quadrangle Location: Springfield North, MA

Map Edited: 1984

Photorevised: 1979

Photoinspected: None

North



Commercial Disposal Co. Inc.

115 Wayside Avenue

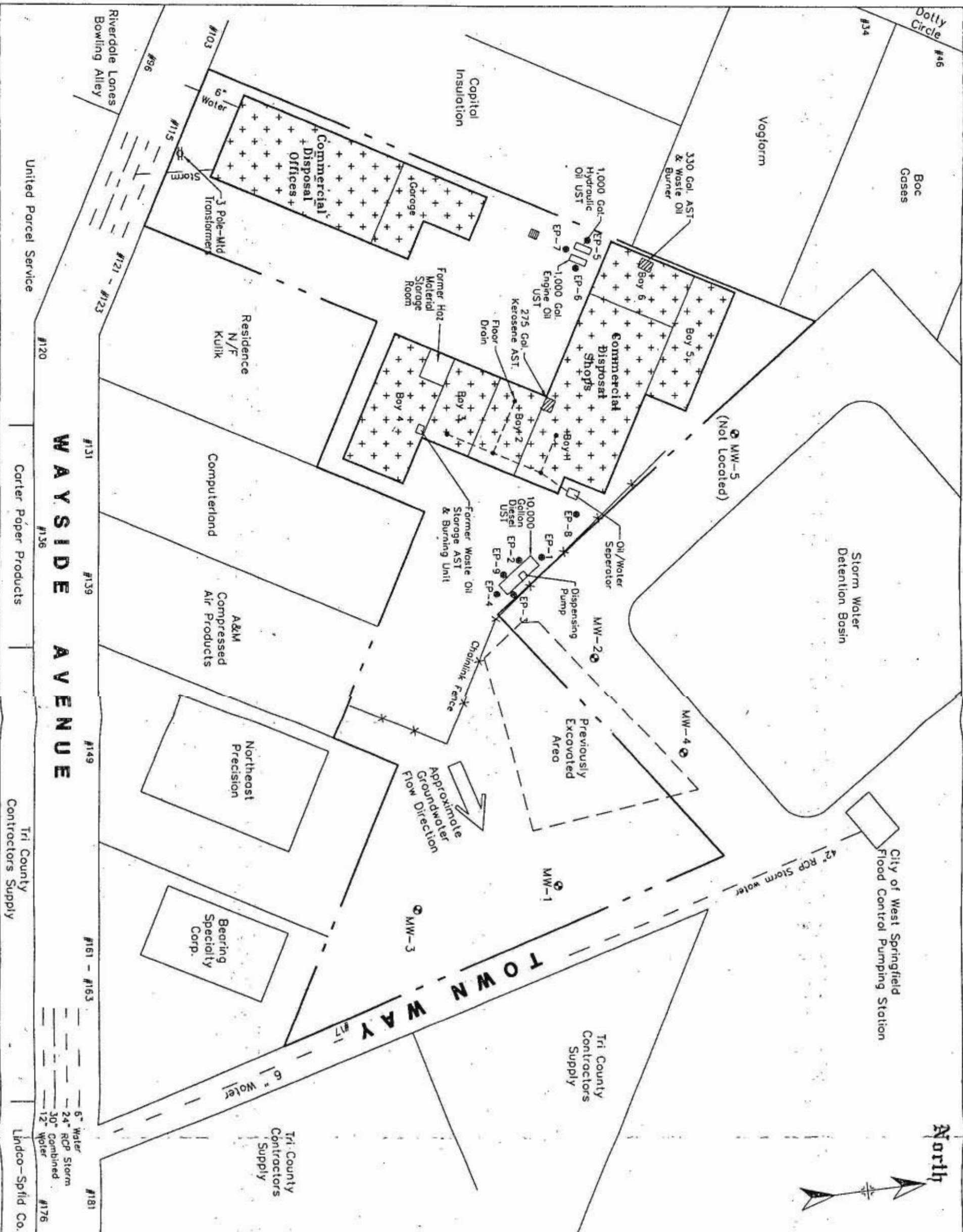
West Springfield, Massachusetts

AutoCAD File: L13997.DWG

Site Locus

Job No.: 13997

Figure - 1



NOTES:

Site plan prepared from plans obtained from City of West Springfield Offices. A plan by H.R.P. Associates, and a site visit by an ECS representative. All locations, and dimensions of the site features, and property lines are approximate. This plan should not be used for construction or land conveyance purposes. No area survey was performed. Oil locations are approximate. Groundwater flow direction based on a plan by HRP Assoc, dated 1/31/91. Locations of monitoring wells, and previously excavated area, based on a plan by HRP Assoc.

Legend

- Approximate Property Line
- Chainlink Fence
- Monitoring Well
- Monitoring Well I.D.
- Catchbasin
- Soil Boring



ENVIRONMENTAL COMPLIANCE SERVICES, INC.
200 Silver Street • Andover, MA 01810
Commercial Disposal Co., Inc.
115 Wayside Avenue
West Springfield, Massachusetts

Site Plan

Client: Commercial Disposal Co., Inc.

Graphic Scale: 1" = 60'

COMPUTER COORDINATES: 517142W, 01810N

DRAWN BY: DESIGNED BY: CHECKED BY: APPROVED BY:

SCALE: DATE: JOB NO.: PROJECT NO.: 1" = 60' Aug. 2000 13997 2

TABLES

115 Wayside Avenue West Springfield, Massachusetts Job # 13997	Table 1 Concentrations of Volatile Petroleum Hydrocarbons (VPH), Extractable Petroleum Hydrocarbons (EPH), and Volatile Organic Compounds (VOC) for Soil (Methods MADEP MADEP VPH 97-12 and MADEP EPH 98-1)			
Sample Location	EP-9 12-14'	EP-2 6-8'	EP-4 2-4'	Reportable Concentrations ⁽²⁾
Sampling Date	7/28/00	7/25/00	7/25/00	RCS-1
VPH Aliphatics/Aromatics (mg/Kg)⁽¹⁾				
C5-C8 Aliphatics Hydrocarbons	36	108	ND/3.39	100
C9-C12 Aliphatics Hydrocarbons	39	386	26	1,000
C9-C10 Aromatics Hydrocarbons	100	520	39	100
VPH Target Analytes (ug/Kg)⁽¹⁾				
Benzene	ND/720	ND/800	ND/230	10,000
Ethylbenzene	3,800	14,400	ND/230	80,000
Methyl-tert-butyl ether	ND/720	ND/800	ND/230	300
Naphthalene	7,600	48,000	4,900	4,000
Toluene	ND/720	ND/800	ND/230	90,000
m,p-Xylenes	10,600	41,600	ND/450	500,000
o-Xylenes	5,400	20,000	ND/230	500,000
EPH Aliphatics/Aromatics (mg/Kg)⁽¹⁾				
C9-C18 Aliphatics Hydrocarbons	ND/30	1,300	ND/30	1,000
C19-C36 Aliphatics Hydrocarbons	ND/30	250	39	2,500
C11-C22 Aromatics Hydrocarbons	ND/30	1,299	ND/30	200
EPH Target PAH Analytes (ug/Kg)⁽¹⁾				
Naphthalene	ND/150	27,000	ND/160	4,000
2-Methylnaphthalene	ND/150	37,000	ND/160	4,000
Acenaphthylene	ND/150	380	ND/160	100,000
Acenaphthene	ND/150	370	ND/160	20,000
Fluorene	ND/150	800	ND/160	400,000
Phenanthrene	ND/150	2,000	ND/160	100,000
All Other Compounds	ND	ND	ND	N/A
NOTES: ND = Not detected at the method detection limits. N/A = Not Applicable. ¹ Milligrams per liter (mg/Kg) or micrograms per liter (ug/Kg) as noted. ² MCP Reportable Concentrations (RCs) pursuant to 310 CMR 40.1600 ³ Standard for Total Xylenes. Bold = Concentrations Above Standards.				

ATTACHMENT I

Administrative Information

ADMINISTRATIVE INFORMATION

PROJECT NUMBER: 13997

DATE STARTED: July 12, 2000	DATE COMPLETED: August 11, 2000
CLIENT: Trailerworks, Inc.	SITE: former Commercial Disposal and Waste Management
CLIENT ADDRESS: 115 Wayside Avenue	ADDRESS: 115 Wayside Avenue and 17 Town Way, West Springfield, Massachusetts
CLIENT CONTACT: Mr. Robb Townsend PHONE: (413) 789-7794	CONTACT ON SITE: PHONE:
CLIENT FILE NO.	
CONTENTS OF ASSESSMENT: SECTION 1 - SITE LOCATION & SETTING SECTION 2 - LOCAL RECORDS REVIEW AND INTERVIEWS WITH LOCAL OFFICIALS SECTION 3 - LOCAL HISTORY SECTION 4 - FEDERAL ENVIRONMENTAL RECORDS SECTION 5 - STATE ENVIRONMENTAL RECORDS SECTION 6 - SITE VISIT	COUNTY: Hampden STATE: Massachusetts NEAREST INTERSECTION / CROSS STREET: Wayside Avenue and Doty Circle
CONFIDENTIALITY: Standard	

SITE LOCATION

USGS QUADRANGLE MAP: Springfield-North

LATITUDE: 42.144626
LONGITUDE: 72.626185

UTM COORDINATES: 4668347.785N
696159.032 E

LOCATION OF SITE RELATIVE TO LANDMARKS:

The site is located approximately 2,900 feet north of the Route 91, Route 5 interchange in West Springfield and about 750 feet west of the Connecticut River.

SITE SETTING

REGIONAL DEVELOPMENT:

The area to the northwest, west, south and southeast is primarily associated with light industrial and commercial enterprises. The area to the north and northeast contain flood control dikes and stormwater pump stations.

REGIONAL TOPOGRAPHY:

Regional topography is flat, given the areas location in the Connecticut River Flood Plain.

ELEVATIONS:

Based on USGS Topographical Maps, the area is at an approximate elevation of 60 mean sea level with the Connecticut River being at approximately 49 feet.

REGIONAL DRAINAGE:

Storm runoff in this area is collected by sewer and is charged into the Connecticut River at the end of Wayside Avenue.

SURFACE WATER:

Surface Water On-site:

No surface water bodies are located on site.

Surface Water Adjacent to the site:

No surface water is located adjacent to the site.

Note: A stormwater detention area just over the northern border is normally dry, except in extreme storm events.

WETLANDS

Wetlands On-site:

None indicated.

Wetlands Adjacent to the Site:

None indicated.

WETLANDS INVENTORY MAPS:

Name of Map: Springfield-North, Mt. Tom

Date: October, 1975

FLOODING POTENTIAL:

ON AND IN THE VICINITY OF THE SITE:

The site is located in the Connecticut River Flood Plain. However, it is protected by an extensive series of dike built by the Army Corps of Engineers in the late 1930s and early 1940s.

FLOOD INSURANCE RATE MAP (FIRM):

The site is located in Zone C, an area of minimal flooding, per FIRM Map # 250155 0001 C, 10/11/1979

SITE GEOLOGY:

SOILS:

Classification:

UH - Urban Land Hadley Winooski Association

Characteristics:

Soils are deep and moderately drained, slopes are 0 to 8 percent. Surface layer is friable, dark gray-brown loam for 12 inches. Substratum is to a depth of 60 inches. Alternating layers of olive silt and fine sand with gray and yellow-red mottles. Permeability is high, as is water capacity.

Information Source:

Sheet 17, Page 52 - USDA Soil Conservation Service, Soil Survey of Hampden County, Central Part, issued May of 1978.

SURFICIAL GEOLOGY:

Sand deposits and fine deposits, undifferentiated.

Estimated Thickness:

Unknown.

Information Source:

Map showing distribution and thickness of the principal fine grain deposits, Connecticut Valley Urban Area, Central New England, by William H. Langer, Map I-1074-C, Sheet 2 of 2.

BEDROCK GEOLOGY:

Description:

Hartford Basin, Portland Formation (Lower Jurassic). Reddish-brown to pale red arkose and siltstone, and gray sandstone, gray siltstone, and black shale interpreted as lake beds.

Information Source:

Bedrock Geologic Map of Massachusetts, E-an, Zen, Editor, 1983.

ASSESSORS OFFICE:

<u>Contact:</u>	<u>Date:</u>	<u>Time:</u>
Personnel	July 31, 2000	1:00-1:15 pm

PRESENT OWNER OF RECORD: Commercial Disposal Company, Inc.

DATES OF PURCHASE: June 1, 1978 and October 1, 1981

LISTED ADDRESS: 600 New Ludlow Road
South Hadley, Massachusetts 01075

MAP AND PARCEL NUMBER(S): Map 81, Parcel 499
Map 81, Parcel 514

DEED BOOK AND PAGE: 5614/80
4614/80
5177/301

AREA: 2.13 Acres in Parcels

HEAT SOURCE: Gas forced hot air.

UTILITY SERVICES ON-SITE: Gas, electricity, sewer, telephone, and water.

Notes:

ASSESSOR'S OFFICE INFORMATION			
BUILDINGS OR STRUCTURES ON SITE			
LOCATION	CONSTRUCTION	NUMBER OF FLOORS	AREA (SQUARE FEET)
115 Wayside Avenue	Masonry Construction	1	Not Specified
17 Town Way	Masonry Construction	1	Not Specified

ASSESSOR'S OFFICE INFORMATION

ABUTTING PROPERTIES

OWNER NAME/ ADDRESS	MAP AND PARCEL NUMBER	LOCATION OF PROPERTY RELATIVE TO SITE	USE	COMMENTS (WATER SUPPLIES, SEPTIC, ETC., LOCATION RELATIVE TO SITE)
William Parentau 103 Wayside Avenue	81-514 2850-81	Southwest	Commercial	All developed properties in the vicinity of the site are presumed to be connected to all public utilities.
Nellie A. Kulik 121-123 Wayside Avenue	81-514 3200 0081	South	Commercial	
E & L Realty Corporation 139 Wayside Avenue	81-514 3200 0081	South	Commercial	
Robert J. Healy 149 Wayside Avenue	3300 0081	South	Commercial	
Robert J. Healy 161 Wayside Avenue	3400 0081	South	Commercial	
Robert Clark, Jr. 181 Wayside Avenue	3350 0080A	South	Commercial	
Hurley & Johnson 34 Doty Circle	81-221 8700 0081	West	Commercial	
Rena R. Jaeger, Jr. 46 Doty Circle	81 - 221 8750 0081	West	Commercial	
Town of West Springfield Flood Control Dike Town Way		North	Flood Control	

Document: Section.2

Local Records Review and Interviews

With Local Officials

BUILDING INSPECTORS / ENGINEERING OFFICE

Contact:

Date:

Time:

Personnel

July 31, 2000

3:45-4:00 pm

BUILDING INSPECTOR'S OFFICE / ENGINEERING OFFICE				
BUILDINGS / STRUCTURES PRESENT ON SITE				
BUILDINGS / STRUCTURES	LOCATION ON SITE	AGE	CONSTRUCTION	COMMENTS
Offices	115 Wayside Avenue	Not Specified	Concrete Block	
Garage	West End of Town Way	Not Specified	Concrete Block	

Notes: Building Department has following permits on file for Commercial Disposal: November 29, 1988, Rebound Storage Building damaged by fire, 250 feet off road, heated by gas; October 9, 1984, New storage at 17 Town Way, no heat.

UTILITY CONNECTIONS / AVAILABILITY (ON-SITE):

Water: Yes

Sewer: Yes

Stormwater: Yes

Electric: Yes

Gas: Yes

UTILITY CONNECTIONS / AVAILABILITY (IN STREET):

Water: Yes

Sewer: Yes

Stormwater: Yes

Electric: Yes

Gas: Yes

ZONING COMMISSION / PLANNING BOARD:

Contact:

Date:

Time:

Personnel

July 31, 2000

4:00-4:15 pm

SITE ZONING:

Designation:

Business B: Across street is industrial park.

Effective Date:

1989

ADJACENT PROPERTIES:

Designation:

Industrial Park (IP)

Effective Date:

1989

PREVIOUS DESIGNATIONS (WITH DATES AND LOCATIONS RELATIVE TO SITE):

Unknown.

ANTICIPATED CHANGES:

On-Site:

None

Neighboring Properties:

None

CONSERVATION COMMISSION:

The Conservation Commission was not contacted as part of the present assessment

HEALTH DEPARTMENT:

Contact:

Date:

Time:

Peg Mc Grady

July 31, 2000

3:30-3:45 pm

WATER SUPPLIES:

On-Site: West Springfield Municipal System

Testing: No testing information was reviewed.

Off-Site: West Springfield Municipal System

NATURE AND LOCATION OF MUNICIPAL WATER SUPPLY:

Southwick Wells and Bearhole Reservoir

TOWN CLERK'S OFFICE

Contact:Date:Time:

Gwen Keough

July 31, 2000

3:45-4:00 pm

TOWN CLERK'S OFFICE PERMIT LISTING SEARCH DISTANCE ON-SITE AND NEIGHBORING PROPERTIES			
DATE OF REVIEW:		JULY 31, 2000	
LOCATION	DATE	PERMIT TYPE	COMMENTS
United Parcel Service 120 Wayside Avenue	11/23/65 11/23/65	700 Gallons AST 15,000 Gas & Diesel UST	10/23/91 Removed one 4,000-gallon diesel tank, one 1,000-gallon oil tank, one 550-gallon waste oil tank, two 4,000-gallon gasoline tanks, and one 550-gallon waste oil tank. Installed one 15,000-gallon diesel and two 10,000-gallon gasoline tanks. 8/17/93 Removed one 10,000-gallon diesel tank.
Tri-County Contractors 154 Wayside Avenue	6/28/60	4,000 Gallons Gasoline	8/21/97 Filled 4,000-gallon tank with cement slurry.
Brinks, Inc. 35 Doty Circle	8/19/70	1,000 Gallons AST 4,000 Gallons UST	8/29/88 Removed one 4,000-gallon UST.

Notes: AST - Above Ground Storage Tank
UST - Underground Storage Tank

Document: Section.2

Local Records Review and Interviews

With Local Officials

Project Number 12142A.21E

August 15, 2000

Page 15

FIRE DEPARTMENT:

Contact:

Lou Lamothe

Date:

August 1, 2000

Time:

9:00am-9:30am

FIRE DEPARTMENT FILE REVIEW
UNDERGROUND STORAGE TANKS SEARCH DISTANCE ON-SITE AND NEIGHBORING PROPERTIES

LOCATION	SIZE (GALLONS)	CONSTRUCTION	CONTENTS	AGE (YEARS)	INSTALLED ¹	REMOVED	COMMENTS (CATHODIC PROTECTION, REPAIRS AND DATES, RELINING (DATE), NOTICE OF LEAKS (DATES), TRANSFER LINES AND PIPING)
17 Town Way	3,000	NS	NS	NA	12/17/73	10/10/86	No record of release
	1,000	NS	NS	NA	12/17/73	11/18/88	No record of release
	10,000	NS	NS	NA	12/17/73	8/28/89	No record of release
	1,000	NS	Oil	5	8/29/89	N/A	NS
	1,000	NS	Hydraulic Oil	5	8/29/89	N/A	NS
35 Doty Circle	10,000	NS	Diesel	5	8/29/89	N/A	NS
	4,000	NS	Gasoline	NA	8/19/70	4/22/88	Tank failed tightness test but no evidence of release noted upon removal of tank.
154 Wayside Avenue	4,000	NS	No. 2 Fuel Oil	34	6/28/60	N/A	
120 Wayside Avenue	15,700	NS	NS	29	11/23/65	N/A	
	4,000	NS	Diesel	N/A	NS	9/23/91	Water readings indicated possible problems.
	1,000	NS	No. 2 Fuel Oil	N/A	NS	9/23/91	
	(2) 550	NS	Waste Oil	N/A	NS	9/23/91	
	15,000	NS	NS	3	11/29/91	N/A	These tanks for diesel and gasoline.
	(2) 10,000	NS	NS	3	11/29/91	N/A	

FEDERAL ENVIRONMENTAL RECORDS

CERCLIS L - 8 LISTINGS

(USEPA COMPREHENSIVE ENVIRONMENTAL RESPONSE, SEARCH DISTANCE:

NO CERCLIS sites are located within 1 mile of the site.

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) LIST OF HAZARDOUS MATERIALS

HANDLERS/GENERATORS

TSD = 1.0 MILES

GENERATORS - ON-SITE AND NEIGHBORING PROPERTIES:

The site is listed as a TSD facility but is awaiting a change of status. The site is also listed as a small quantity generator of hazardous waste.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

EMERGENCY RESPONSE (ER) FILE REVIEW

SEARCH DISTANCE
ON-SITE AND NEIGHBORING PROPERTIES

FILE LOCATIONS (TOWNS): WEST SPRINGFIELD

FILE DATES: AS SPECIFIED

DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
93	No Emergency Response on record.	
5/20/93	74 Wayside Avenue (Mikes Wholesale Bait) Former Sanford Tool - Possible Unsafe Use of formaldehydes reported investigated (unfounded) W93-264. OSHA asked to investigate.	200 feet west.
8/28/91	Report of truck discharging milky white substance to storm drain (or Wayside and Doty Circle). Investigated, case closed.	200 feet west.
10/30/90	Booms in river from United Parcel Service. Spill not working right, storm system will be flushed by O.R. Cote to cleanout.	United Parcel Service is south across Wayside Avenue.
7/8/93	United Parcel Service changing floor drains to town sewer. No problem.	Site No.
12/4/72	17 Town Way - Bill of Lading No. 818 issued to dispose of four drums of Kwick Wick at Vicon Recovery. O.R. diesel spill.	Site No. On-site
12/01/92	17 Town Way - Thirty gallons diesel to pavement, nozzle fell out of tank.	On-site (case closed)
8/26/92	GES while working on another job United Parcel Service floor drains and notify DEP.	
88 - 89	Nothing.	
12/5/87	130 Doty Circle - Fifty gallons hydraulic fluid from rubbish truck.	200 feet west.
10/21/80	Wayside fuel from delivery truck spilled three gallons. Speedi-dry.	On-site
4/20/86	17 Town Way - Five gallon overflow speedi-dry.	On-site

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

LEAKING UNDERGROUND STORAGE TANKS FILE REVIEW

SEARCH DISTANCE
0.5 MILES

FILE LOCATIONS (TOWNS): WEST SPRINGFIELD

FILE DATES: AS SPECIFIED

DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
1/27/88	Waste oil overflowed UST. Cyn cleaned.	124 Ashley Avenue 0.3 miles south.
6/6/89	Oil out of storm drain into river from United Parcel Service diesel small overflow	United Parcel Service is across Wayside Avenue to the south.
4/30/86	Commercial Disposal - 10,000 gallon No. 2 diesel test failed tight test	149 Wayside Avenue abutter to the south.
5/15/86	Air released from buried manhole and retested without air interface. Passed (DEP notified by Nancy Frantoni, Compliance Manager, letter sent to West Springfield Fire Department on April 30, 1986.	On-site.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATE LANDFILL OR SOLID WASTE DISPOSAL SITES:

No landfills or solid waste disposal sites were noted within 0.5 miles of the site.

DEPARTMENT OF ENVIRONMENTAL PROTECTION			
SITES FILE REVIEW			
LOCATIONS OF FILES (TOWNS): WEST SPRINGFIELD			
SITE NUMBER	ADDRESS	LOCATION (RELATIVE TO SITE)	CITATION
10929	Exxon Station 1247 Riverdale Street	0.4 miles southwest of the site.	Phase II, RAO
10898	Red's Exxon 1528 Riverdale Street	0.3 miles northwest of the site.	Phase II, RAO
10710	Sanford Tool 79 Wayside Avenue	200 feet west of the site.	Phase II, NFA
1-0464	35 Wayside Avenue	200 feet west of the site.	NFA

WATER SUPPLY OVERLAYS

QUADRANGLES CHECKED: West Springfield

SITE QUADRANGLE: West Springfield

AQUIFER TYPE:

On-site:

M₉ - Capable of yielding 1 to 1,000 gallons per minute to individual wells.

Adjacent to site: M₉

WATER SUPPLIES:

No public water supplies were noted within 1 mile of the site.

CONTAMINATION SOURCES:

A salt storage facility was noted within 0.5 miles southwest of the site.

SITE VISIT:

PERFORMED BY: Mr. Karl M. Dietzler

ACCOMPANIED BY:

DATE PERFORMED: July 31, 2000

CURRENT USE OF SITE:

Vacant

FORMER USE(S) OF SITE:

Offices and garage for Commercial Disposal. Some space is also utilized by Oil Recovery Corporation.

DEVELOPMENT:

Buildings:

Two buildings are located on-site. One building is located close to Wayside Avenue and was utilized as an office building. The second building is a garage building last used for maintenance of Commercial Disposal and Oil Recovery vehicles. This building is approximately 200 feet from Wayside Avenue.

Evidence of Former Buildings/Structures:

No evidence of former buildings was noted during the site visits.

CURRENT HEATING METHOD:

The office building is heated a natural gas system. The garage building is also heated by a natural gas system which is supplemented by a waste oil burning heating system located in Bay 6.

Evidence of Former Heating Method(s):

No evidence of former heating methods was noted during the site visit.

WASTE DISPOSAL:

No evidence of current or former waste disposal methods were noted during the site visit.

ROADWAYS:

Access to the site is gained from either Wayside Avenue to the south of the site or Town Way located to the east of the site.

PARKING AREAS (PAVEMENT, ASPHALT/CONCRETE, CONDITION, AREA AND LOCATIONS COVERED):

Parking for cars along east side of the office building. Parking for trucks in the paved area to the east of the garage building.

CATCHBASINS (STORMWATER):

One stormwater catch basin is located between the office building and Bay 6 of the garage building.

UTILITIES ON SITE:

The site is serviced by natural gas, electricity, telephone, municipal water and municipal sewer connections.

Utilities Formerly on Site:

No evidence of former utilities was noted on the site.

WELLS (DRINKING/INDUSTRIAL/IRRIGATION) PRESENT ON SITE:

Four of five groundwater monitoring wells installed by HRP Associates were located on the site.

FENCING (ACCESS LIMITATIONS):

Fencing is located along the site boundary to the east and north between the site and West Springfield Flood Control property.

EVIDENCE OF FILLING/EXCAVATION:

An area of the site has been excavated, filled and paved as part of a RCRA closure of the site, however, no evidence of the excavation was noted during the site visit.

OIL AND HAZARDOUS MATERIALS CURRENTLY USED / STORED ON-SITE:

Waste oil containers and a waste oil burner were observed in Bay 6 of the garage building. This waste oil and burner supplements the gas fired heating system. Various automotive repair fluids were utilized in the garage building. One 500-gallon kerosene above ground storage tank in Bay 1 is used to fuel a steam cleaner which is used to clean vehicles. Three underground storage tank (UST) are located on the site. One 10,000-gallon UST (diesel) and two 1,000-gallon USTs (hydraulic oil and engine oil) are located on the site.

FACILITIES PRESENT (ON-SITE):

<u>Floor Drains:</u>	Floor drains in the maintenance building collect wastewater from vehicle maintenance. This waste discharges to an on-site oil/water separator
<u>Dry wells/Pits:</u>	None observed.
<u>Machine Pits:</u>	None observed.
<u>Service Pits:</u>	None observed.
<u>Hydraulic Lifts:</u>	None observed.
<u>Pump Islands:</u>	One dispensing pump associated with the 10,000-gallon UST was observed.
<u>Loading Racks:</u>	None observed.

Lagoons: None observed.

Transformers: None observed.

FACILITIES PRESENT (ADJACENT TO SITE):

Pump Islands: UPS which is located south of the site across Wayside Avenue is equipped with a pump island.

Loading Racks: None observed.

Lagoons: None observed.

Transformers: Pole mounted transformers were observed along Wayside Avenue.

VEGETATION (INDICATIONS OF STRESS, ABSENCE OF VEGETATION):

The site is almost entirely paved or covered by buildings. Very little vegetation was observed on-site. Vegetation present around the office building did not appear to be stressed. Vegetation on surrounding property also did not appear to be stressed.

WETLANDS:

No evidence of wetlands was noted during the site visit.

SURFACE SOIL (INDICATIONS OF STAINING, RELEASES):

Incidental oil staining was noted in the paved areas of the site. Surficial oil staining was noted on asphalt in the eastern part of the site.

ABUTTING PROPERTIES:

Use:

Abutting properties to the south include a residential house, commercial and industrial businesses and

Wayside Avenue. Town Way abuts the site to the east.

Use/Storage/Disposal of Oil/Hazardous Materials:

Commercial and industrial businesses on Doty Circle abut the site to the west.

ATTACHMENT II

New England DataMap

DataMap Technology Corporation

Environmental FirstSearch™ Report

TARGET PROPERTY:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

Job Number: 13997

PREPARED FOR:

Environmental Compliance Services, Inc.

588 Silver Street

Agawam, Massachusetts 01001

07-26-00



Tel: (781) 320-3720

Fax: (781) 320-3715

Environmental FirstSearch

Search Summary Report

Target Site: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

FirstSearch Summary

Database	Sel	Updated	Radius	Site	1/8	1/4	1/2	1/2 >	ZIP	TOTALS
NPL	Y	01-19-00	1.00	0	0	0	0	0	0	0
CERCLIS	Y	04-16-00	1.00	0	0	0	0	0	0	0
RCRA TSD	Y	06-24-00	0.50	1	0	0	0	-	0	1
RCRA COR	Y	06-24-00	1.00	1	0	0	0	0	0	1
RCRA GEN	Y	06-24-00	0.25	1	2	3	-	-	0	6
RCRA NLR	Y	10-18-99	0.25	1	1	3	-	-	0	5
ERNS	Y	01-06-00	0.25	0	0	0	-	-	0	0
NPDES	N	10-18-99	0.25	-	-	-	-	-	-	-
FINDS	N	09-21-99	0.25	-	-	-	-	-	-	-
TRIS	N	07-16-98	0.25	-	-	-	-	-	-	-
State Sites	Y	05-10-00	1.00	0	0	2	7	9	0	18
Spills-1990	Y	06-09-00	0.25	1	4	4	-	-	0	9
Spills-1980	Y	03-10-98	0.25	0	1	1	-	-	0	2
SWL	Y	12-07-99	0.50	0	0	0	0	-	0	0
Permits	N	NA	0.25	-	-	-	-	-	-	-
Other	N	NA	0.25	-	-	-	-	-	-	-
REG UST/AST	Y	03-29-00	0.25	2	1	2	-	-	1	6
Leaking UST	N	NA	0.50	-	-	-	-	-	-	-
State Wells	N	12-02-99	0.50	-	-	-	-	-	-	-
Aquifers	N	01-20-99	0.50	-	-	-	-	-	-	-
ACEC	N	01-20-99	0.50	-	-	-	-	-	-	-
Wetlands	N	12-31-99	0.50	-	-	-	-	-	-	-
Floodplains	N	09-01-96	0.50	-	-	-	-	-	-	-
Receptors	Y	01-01-95	0.50	0	0	0	0	-	0	0
Nuclear Permits	N	04-30-99	0.50	-	-	-	-	-	-	-
Historic/Landmark	N	09-01-99	0.50	-	-	-	-	-	-	-
Federal Land Use	N	06-17-98	0.50	-	-	-	-	-	-	-
Federal Wells	N	NA	0.50	-	-	-	-	-	-	-
Releases(Air/Water)	N	NA	0.25	-	-	-	-	-	-	-
- TOTALS -				7	9	15	7	9	1	48

Notice of Disclaimer

Due to the limitations, constraints, inaccuracies and incompleteness of government information and computer mapping data currently available to DataMap Technology Corp., certain conventions have been utilized in preparing the locations of all federal, state and local agency sites residing in DataMap Technology Corp.'s databases. All EPA NPL and state landfill sites are depicted by a rectangle approximating their location and size. The boundaries of the rectangles represent the eastern and western most longitudes; the northern and southern most latitudes. As such, the mapped areas may exceed the actual areas and do not represent the actual boundaries of these properties. All other sites are depicted by a point representing their approximate address location and make no attempt to represent the actual areas of the associated property. Actual boundaries and locations of individual properties can be found in the files residing at the agency responsible for such information.

Waiver of Liability

Although DataMap Technology Corp. uses its best efforts to research the actual location of each site, DataMap Technology Corp. does not and can not warrant the accuracy of these sites with regard to exact location and size. All authorized users of DataMap Technology Corp.'s services proceeding are signifying an understanding of DataMap Technology Corp.'s searching and mapping conventions, and agree to waive any and all liability claims associated with search and map results showing incomplete and or inaccurate site locations.

*Environmental FirstSearch
Site Information Report*

Request Date: 07-26-00

Search Type: COORD

Requestor Name: Karl M. Dietzler

Job Number: 13997

Standard: ASTM

FILTERED REPORT

Target Address: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

Demographics

Sites: 48

Non-Geocoded: 1

Population: 1543

Radon: 0.8 - 8.1 PCIL/L

Site Location

	<u>Degrees (Decimal)</u>	<u>Degrees (Min/Sec)</u>		<u>UTMs</u>
Longitude:	-72.622865	-72:37:22	Easting:	696434.634
Latitude:	42.144225	42:8:39	Northing:	4668310.895
			Zone:	18

Comment

Comment:

Additional Requests/Services

Adjacent ZIP Codes: 0.00 Mile(s)

Services:

ZIP				
Code	City Name	ST	Dist/Dir	Sel

	<u>Requested?</u>	<u>Date</u>
Sanborns	N	
Aerial Photographs	N	
Topo Maps (hardcopy)	N	
City Directories	N	
Title Search	N	
Municipal Reports	N	
Online Topo Map	N	

Environmental FirstSearch Sites Summary Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

TOTAL: 48 GEOCODED: 47 NON GEOCODED: 1 SELECTED: 39

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
1	RCRA	COMMERCIAL DISPOSAL CO INC MAD002791515/TSD	17 TOWN WAY WEST SPRINGFIELD MA 01089	0.00 --	1
2	RCRACOR	COMMERCIAL DISPOSAL CO INC MAD002791515/TSD	17 TOWN WAY WEST SPRINGFIELD MA 01089	0.00 --	1
3	RCRAGN	INTERNATIONAL BEAM WELDING CORP MAD981062961/VGN	63 DOTY CIR WEST SPRINGFIELD MA 01089	0.15 NW	2
4	RCRAGN	NORTEK INC MAD043249432/SGN	70 DOTY CIR WEST SPRINGFIELD MA 01089	0.14 NW	3
5	RCRAGN	NUMERIC MACHINING CO INC MAD108282377/SGN	195 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.09 SW	4
6	RCRAGN	OIL RECOVERY CORP MAD079224341/SGN	17 TOWN WAY WEST SPRINGFIELD MA 01089	0.00 --	1
7	RCRAGN	OMALLEY M J CO MAD982196354/VGN	54 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.19 SW	5
8	RCRAGN	UNITED PARCEL SERVICE MAD985268663/VGN	120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.10 SW	7
9	RCRANLR	ARMSTRONG TOOL INC MAD066974429/NLR	122 DOTY CIR WEST SPRINGFIELD MA 01089	0.23 NW	8
10	RCRANLR	COMMERCIAL DISPOSAL CO INC MAD002791515/NLR	17 TOWN WAY WEST SPRINGFIELD MA 01089	0.00 --	1
11	RCRANLR	MED WASTE MANAGEMENT INC MAD985278316/NLR	150 DOTY CIR WEST SPRINGFIELD MA 01089	0.22 NW	10
12	RCRANLR	SANFORD TOOL & DESIGN INC MAD054431143/NLR	79 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.14 SW	11
13	RCRANLR	SPACE AGE ASSOC INC MAD066995515/NLR	195 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.09 SW	4
14	STATE	BERNARDINO S BAKERY 1-0000764/NFA	105 EXCHANGE ST. CHICOPEE MA 01013	0.57 NE	12
15	STATE	CABOTVILLE INDUSTRIAL PARK 1-0000468/NFA	165 FRONT ST. CHICOPEE MA 01013	0.71 NE	13
16	STATE	CHICOPEE GAS LIGHT COMPANY 1-0000610/DEF TIER 1B	DEPOT ST. CHICOPEE MA 01013	0.44 NE	14
17	STATE	DEPOT STREET PONDS 1-0000399/TIER 1A	200 DELTA PARK CHICOPEE MA 01013	0.37 NE	15
18	STATE	DICK S MOBIL #01-FG1 1-0000766/RAO	1130 RIVERDALE ST. WEST SPRINGFIELD MA 01089	0.60 SW	16
19	STATE	DWIGHT CANAL 1-0000609/TIER 1A	DEPOT ST. CHICOPEE MA 01013	0.35 NE	17
20	STATE	EASTERN ETCHING 1-0000036/NFA	GRAPE ST. CHICOPEE MA 01013	0.99 NE	18

Environmental FirstSearch Sites Summary Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

TOTAL: 48 GEOCODED: 47 NON GEOCODED: 1 SELECTED: 39

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
21	STATE	EXXON STATION 1-0000929/RAO	1247 RIVERDALE ST WEST SPRINGFIELD MA 01089	0.41 SW	9
22	STATE	HAMPDEN POWER PLANT SITE 1-0000038/TIER 1A	DEPOT ST. CHICOPEE MA 01013	0.29 NE	19
23	STATE	MOBIL STATION 01-QDW 1-0000373/UNCLASSIFIED	229 CENTER ST. CHICOPEE MA 01013	0.62 SE	20
24	STATE	PARCEL B 1-0000775/NDS	1100 RIVERDALE RD. WEST SPRINGFIELD MA 01089	0.67 SW	21
25	STATE	PRIDE CITGO 1-0011709	1247 RIVERDALE STREET WEST SPRINGFIELD MA 01089	0.41 SW	9
26	STATE	PROPERTY 1-0011074/TIER 2	128 ALTHEA ST WEST SPRINGFIELD MA 01089	0.87 NW	22
27	STATE	PROPERTY 1-0000464/NFA	35 WAYSIDE AVE. WEST SPRINGFIELD MA 01089	0.23 SW	23
28	STATE	REDS EXXON 1-0000898/RAO	1528 RIVERDALE ST WEST SPRINGFIELD MA 01089	0.34 NW	6
29	STATE	REPUBLIC OIL 1-0000044/TIER 2	181 CENTER ST. CHICOPEE MA 01013	0.67 SE	24
30	STATE	SANFORD TOOL AND DESIGN 1-0000710/NFA	79 WAYSIDE AVE. WEST SPRINGFIELD MA 01089	0.14 SW	11
31	STATE	TRANSCOMM, INC. 1-0001060/RAO	63 CENTER STREET CHICOPEE MA 01013	0.82 NE	25
32	SPILLS	ED SYPEK CONSTRUCTION 1-0012655/72 HR	154 ASHLEY AVE WEST SPRINGFIELD MA 01089	0.25 SE	26
33	SPILLS	MICHAEL S WHOLESALE BAIT W93-0264	WAYSIDE AVENUE WEST SPRINGFIELD MA 01089	0.16 SW	27
34	SPILLS	MIKE S WHOLESALE BAIT W93-0274	74 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.16 SW	27
35	SPILLS	OR DIESEL SPILL W92-0676	17 TOWN WAY WEST SPRINGFIELD MA 01089	0.00 --	1
36	SPILLS	STORM DRAIN W91-0504	CORNER OF DOTY CIRCLE/WAYSIDE WEST SPRINGFIELD MA 01089	0.14 SW	28
37	SPILLS	UNITED PARCEL SERVICE W91-0542	120 WAYSIDE AVENUE WEST SPRINGFIELD MA 01089	0.10 SW	7
38	SPILLS	UNITED PARCEL SERVICES W90-0694	120 WAYSIDE AVENUE WEST SPRINGFIELD MA 01089	0.10 SW	7
39	SPILLS	UPS W92-0472	120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.10 SW	7
40	SPILLS	UPS FACILITY W93-0427	120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.10 SW	7

*Environmental FirstSearch
Sites Summary Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

TOTAL: 48 **GEOCODED:** 47 **NON GEOCODED:** 1 **SELECTED:** 39

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
41	SPILLS80	W89-0269	120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.10 SW	7
42	SPILLS80	W89-0153	ASHLEY AVE & WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.13 SE	29
43	UST	BRINKS INC 0-007764	35 DOTY CIR WEST SPRINGFIELD MA 01089	0.15 NW	30
44	UST	COMMERCIAL DISPOSAL CO. 0-007816	17 TOWN WAY WEST SPRINGFIELD MA 01089	0.00 -	1
45	UST	COMMERCIAL DISPOSAL COMPANY INC 0-030081	17 TOWN WAY WEST SPRINGFIELD MA 01089	0.00 -	1
46	UST	EDWARD S SYPEK 0-007765	154 ASHELY AVE WEST SPRINGFIELD MA 01089	0.25 SE	26
47	UST	UNITED PARCEL SERVICE 0-007822	120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	0.10 SW	7

*Environmental FirstSearch
Sites Summary Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

TOTAL: 48 **GEOCODED:** 47 **NON GEOCODED:** 1 **SELECTED:** 39

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
48	UST	WAYSIDE AVENUE DIKE STATION 0-000978	OFF WAYSIDE AVE WEST SPRINGFIELD MA 01089	NON GC	

Environmental FirstSearch
Site Detail Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA TSD SITE

SEARCH ID: 1 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: COMMERCIAL DISPOSAL CO INC
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD002791515
ID2:
STATUS: TSD
PHONE: 4137371129

CONTACT: STONE LARRY

ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089

NOTIFIED: 07/24/80
PART A:

ACTIVITIES: SUBJECT TO CORRECTIVE ACTION

CM/E LIST: **VIOL DATE:** 11-14-97 **AGENCY:** S, X **UPDATED:** 11-14-97
RAATS: Y **ACTION DATE:** 07-15-85 **DOCKET:** 84-1056 **UPDATED:**

VIOL: DCL, DOT, FEA, DFR
NUM: 12
ENF: 120, 210, 310
DATE: 07-16-85

ASSESS:

SETTLE: 34200.00

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA COR SITE

SEARCH ID: 2 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: COMMERCIAL DISPOSAL CO INC
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD002791515
ID2:
STATUS: TSD
PHONE: 4137371129

CONTACT: STONE LARRY

VENT	DATE	STATUS
CA075	03-30-94	ME
CA225	04-14-95	IN
CA050	04-14-95	RF

Environmental FirstSearch *Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA GENERATOR SITE

SEARCH ID: 3 **DIST/DIR:** 0.15 NW **MAP ID:** 2

NAME: INTERNATIONAL BEAM WELDING CORP
ADDRESS: 63 DOTY CIR
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD981062961
ID2:
STATUS: VGN
PHONE: 4137814368

CONTACT: STROUCH VERONICA

ADDRESS: OWNERSTREET
OWNERCITY MA 99999

NOTIFIED:
PART A:

ACTIVITIES: VG: GENERATES LESS THAN 100 KG/MONTH OF HAZARDOUS WASTE

CM+E LIST:

VIOL DATE:

AGENCY:

UPDATED: 11-10-98

RAATS:

ACTION DATE:

DOCKET:

UPDATED: 06-24-96

VIOL:

NUM:

ENF:

DATE:

ASSESS:

SETTLE:

RCRA GENERATOR SITE

SEARCH ID: 4 **DIST/DIR:** 0.14 NW **MAP ID:** 3

NAME: NORTEK INC
ADDRESS: 70 DOTY CIR
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD043249432
ID2:
STATUS: SGN
PHONE: 4137814778

CONTACT: LABRECQUE ROBERT

ADDRESS: OWNERSTREET
OWNERCITY MA 99999

NOTIFIED: 01/07/85
PART A:

ACTIVITIES: SG: GENERATES 100-1000 KG/MONTH OF HAZARDOUS WASTE

CM+E LIST: Y

VIOL DATE: 05-22-92

AGENCY: S

UPDATED: 11-10-98

RAATS:

ACTION DATE:

DOCKET:

UPDATED: 06-24-96

VIOL: GER

NUM: 2

ENF: 120

DATE: 06-03-92

ASSESS:

SETTLE:

Environmental FirstSearch
Site Detail Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA GENERATOR SITE

SEARCH ID: 5 **DIST/DIR:** 0.09 SW **MAP ID:** 4

NAME: NUMERIC MACHINING CO INC
ADDRESS: 195 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD108282377
ID2:
STATUS: SGN
PHONE: 4137326544

CONTACT: MCGOVERN JOSEPH

ADDRESS: OWNERSTREET
OWNERCITY MA 99999

NOTIFIED: 12/16/86
PART A:

ACTIVITIES: SG: GENERATES 100-1000 KG/MONTH OF HAZARDOUS WASTE

CM+E LIST:
RAATS:

VIOL DATE:
ACTION DATE:

AGENCY:
DOCKET:

UPDATED: 11-10-98
UPDATED: 06-24-96

VIOL:
NUM:
ENF:
DATE:

ASSESS:

SETTLE:

RCRA GENERATOR SITE

SEARCH ID: 6 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: OIL RECOVERY CORP
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD079224341
ID2:
STATUS: SGN
PHONE: 4137371129

CONTACT: GAGNON JONATHAN-D

ADDRESS: 89 CHARON TERRACE
SOUTH HADLEY MA 01075

NOTIFIED: 07/24/80
PART A:

ACTIVITIES: SG: GENERATES 100-1000 KG/MONTH OF HAZARDOUS WASTE

CM+E LIST:
RAATS:

VIOL DATE:
ACTION DATE:

AGENCY:
DOCKET:

UPDATED: 11-10-98
UPDATED: 06-24-96

VIOL:
NUM:
ENF:
DATE:

ASSESS:

SETTLE:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA GENERATOR SITE

SEARCH ID: 7 **DIST/DIR:** 0.19 SW **MAP ID:** 5

NAME: OMALLEY M J CO
ADDRESS: 54 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD982196354
ID2:
STATUS: VGN
PHONE: 6175551212

CONTACT: M J OMALLEY INC

ADDRESS: OWNERSTREET
OWNERCITY MA 99999

NOTIFIED:
PART A:

ACTIVITIES: VG: GENERATES LESS THAN 100 KG/MONTH OF HAZARDOUS WASTE

CM+E LIST:
RAATS:

VIOL DATE:
ACTION DATE:

AGENCY:
DOCKET:

UPDATED: 11-10-98
UPDATED: 06-24-96

VIOL:
NUM:
ENF:
DATE:

ASSESS:

SETTLE:

RCRA GENERATOR SITE

SEARCH ID: 8 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UNITED PARCEL SERVICE
ADDRESS: 120 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD985268663
ID2:
STATUS: VGN
PHONE: 6175551212

CONTACT: UNITED PARCEL SERVICE

ADDRESS: OWNERSTREET
OWNERCITY MA 99999

NOTIFIED:
PART A:

ACTIVITIES: VG: GENERATES LESS THAN 100 KG/MONTH OF HAZARDOUS WASTE

CM+E LIST:
RAATS:

VIOL DATE:
ACTION DATE:

AGENCY:
DOCKET:

UPDATED: 11-10-98
UPDATED: 06-24-96

VIOL:
NUM:
ENF:
DATE:

ASSESS:

SETTLE:

Environmental FirstSearch *Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA NLR SITE			
SEARCH ID: 9	DIST/DIR: 0.23 NW	MAP ID: 8	
NAME: ARMSTRONG TOOL INC ADDRESS: 122 DOTY CIR WEST SPRINGFIELD MA 01089		REV: ID1: MAD066974429 ID2: STATUS: NLR PHONE: 4137851843	
CONTACT: WELCH DAVID			
ADDRESS: OWNERSTREET OWNERCITY MA 99999		NOTIFIED: PART A:	
ACTIVITIES:			
CM+E LIST:	VIOL DATE: 02-18-87	AGENCY: S	UPDATED: 11-10-98
RAATS:	ACTION DATE:	DOCKET:	UPDATED: 06-24-96
VIOL: GER			
NUM: 1			
ENF:			
DATE:	ASSESS:	SETTLE:	

RCRA NLR SITE			
SEARCH ID: 10	DIST/DIR: 0.00 --	MAP ID: 1	
NAME: COMMERCIAL DISPOSAL CO INC ADDRESS: 17 TOWN WAY WEST SPRINGFIELD MA 01089		REV: ID1: MAD002791515 ID2: STATUS: NLR PHONE: 4137371129	
CONTACT: GAGNON RICHARD-E			
ADDRESS: 149 WAYSIDE AVENUE (PO BOX 30 WEST SPRINGFIELD MA 01089		NOTIFIED: 07/24/80 PART A:	
ACTIVITIES:			
CM+E LIST:	VIOL DATE: 05-22-84	AGENCY: S, X	UPDATED: 11-10-98
RAATS: Y	ACTION DATE: 07-15-85	DOCKET: 84-1056	UPDATED:
VIOL: DCL, DOT, FEA, DFR			
NUM: 22			
ENF: 120, 210, 310			
DATE: 07-16-85	ASSESS:	SETTLE: 34200.00	

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA NLR SITE

SEARCH ID: 11 **DIST/DIR:** 0.22 NW **MAP ID:** 10

NAME: MED WASTE MANAGEMENT INC
ADDRESS: 150 DOTY CIR
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD985278316
ID2:
STATUS: NLR
PHONE: 6175551212

CONTACT: NED WASTE MANAGEMENT INC

ADDRESS: OWNERSTREET
OWNERCITY MA 99999

NOTIFIED:
PART A:

ACTIVITIES:

CM+E LIST: **VIOL DATE:** **AGENCY:** **UPDATED:** 11-10-98
RAATS: **ACTION DATE:** **DOCKET:** **UPDATED:** 06-24-96

VIOL:
NUM:
ENF:
DATE: **ASSESS:** **SETTLE:**

RCRA NLR SITE

SEARCH ID: 12 **DIST/DIR:** 0.14 SW **MAP ID:** 11

NAME: SANFORD TOOL & DESIGN INC
ADDRESS: 79 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV:
ID1: MAD054431143
ID2:
STATUS: NLR
PHONE: 4137392583

CONTACT: KURLAND NORMAN

ADDRESS: OWNERSTREET
OWNERCITY MA 99999

NOTIFIED:
PART A:

ACTIVITIES:

CM+E LIST: **VIOL DATE:** **AGENCY:** **UPDATED:** 11-10-98
RAATS: **ACTION DATE:** **DOCKET:** **UPDATED:** 06-24-96

VIOL:
NUM:
ENF:
DATE: **ASSESS:** **SETTLE:**

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

RCRA NLR SITE			
SEARCH ID: 13	DIST/DIR: 0.09 SW	MAP ID: 4	
NAME: SPACE AGE ASSOC INC	REV:		
ADDRESS: 195 WAYSIDE AVE	ID1: MAD066995515		
WEST SPRINGFIELD MA 01089	ID2:		
CONTACT: TOWER GEORGE-W	STATUS: NLR		
	PHONE: 4137391937		
ADDRESS: OWNERSTREET	NOTIFIED:		
OWNERCITY MA 99999	PART A:		
ACTIVITIES:			
CM+E LIST:	VIOL DATE:	AGENCY:	UPDATED: 11-10-98
RAATS:	ACTION DATE:	DOCKET:	UPDATED: 06-24-96
VIOL:			
NUM:			
ENF:			
DATE:	ASSESS:	SETTLE:	

Environmental FirstSearch
Site Detail Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 16

DIST/DIR: 0.44 NE

MAP ID: 14

NAME: CHICOPEE GAS LIGHT COMPANY
ADDRESS: DEPOT ST.
CHICOPEE MA 01013

REV: 05/10/00
ID1: 1-0000610
ID2:
STATUS: DEF TIER 1B
PHONE:

CONTACT:

LTBI: 4/15/89

CONFIRMED:

DELETED:

REMOVED:

SITE INFORMATION:

INITIATED: SAB
ACTION BY: DEP ONLY

CURRENT STATUS: P.A. L
SITE STATUS: DEF TIER 1B

ACTION TAKEN (REM CODE):
REQ TYPE: NON-PRIOR

REQ DUE: 8/2/96

SITE DESCRIPTION:

OTHER CONTAMINATION:
OTHER RELEASES:
OTHER PROBLEMS:
OTHER TYPE OF SITE:

SITE ACTIONS:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 17 **DIST/DIR:** 0.37 NE **MAP ID:** 15

NAME: DEPOT STREET PONDS
ADDRESS: 200 DELTA PARK
CHICOPEE MA 01013

REV: 05/10/00
ID1: 1-0000399
ID2:
STATUS: TIER 1A
PHONE:

CONTACT:

LTBI: 4/15/88 **CONFIRMED:** 7/15/88 **DELETED:** **REMOVED:**

SITE INFORMATION:

INITIATED: SAB
ACTION BY: RP ONLY

CURRENT STATUS: PHASE 2
SITE STATUS: TIER 1A

ACTION TAKEN (REM CODE):
REQ TYPE:

REQ DUE:

SITE DESCRIPTION: AIR RELEASE; FORMER; GROUNDWATER RELEASE; INDUSTRIAL SITE; PETROLEUM PRESENT;
RELEASE TO SOIL; SURFACE WATER RELEASE;

OTHER CONTAMINATION:

OTHER RELEASES:

OTHER PROBLEMS:

OTHER TYPE OF SITE:

SITE ACTIONS:

TS DATE: 5/17/96
RA STATUS: APORAL
AUL DATE:
LSP:

RAS TYPE: IRA
RAO CLASS:
AUL RESTRICTION:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 19 **DIST/DIR:** 0.35 NE **MAP ID:** 17

NAME: DWIGHT CANAL
ADDRESS: DEPOT ST.
CHICOPEE MA 01013

REV: 05/10/00
ID1: 1-0000609
ID2:
STATUS: TIER 1A
PHONE:

CONTACT:

LTBI: 4/15/89 **CONFIRMED:** 4/15/89 **DELETED:** **REMOVED:**

SITE INFORMATION:

INITIATED: SAB
ACTION BY: RP ONLY

CURRENT STATUS: PHASE 1 C
SITE STATUS: TIER 1A

ACTION TAKEN (REM CODE):
REQ TYPE:

REQ DUE:

SITE DESCRIPTION:

OTHER CONTAMINATION:
OTHER RELEASES:
OTHER PROBLEMS:
OTHER TYPE OF SITE:

SITE ACTIONS:

TS DATE: 8/10/99
RA STATUS: CSRCVD
AUL DATE:
LSP:

RAS TYPE: PHASE I
RAO CLASS:
AUL RESTRICTION:

TS DATE: 3/10/98
RA STATUS: RECPT
AUL DATE:
LSP:

RAS TYPE: DEP-1A
RAO CLASS:
AUL RESTRICTION:

Environmental FirstSearch
Site Detail Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 21 **DIST/DIR:** 0.41 SW **MAP ID:** 9

NAME: EXXON STATION
ADDRESS: 1247 RIVERDALE ST
WEST SPRINGFIELD MA 01089

REV: 05/10/00
ID1: 1-0000929
ID2:
STATUS: RAO
PHONE:

CONTACT:

LTBI: 1/15/92 **CONFIRMED:** 7/15/93 **DELETED:** **REMOVED:**

SITE INFORMATION:

INITIATED: ERB
ACTION BY: RP ONLY

CURRENT STATUS: PHASE 2
SITE STATUS: RAO

ACTION TAKEN (REM CODE):
REQ TYPE:

REQ DUE:

SITE DESCRIPTION: GAS STATION; GASOLINE PRESENT; GROUNDWATER RELEASE; CONTAINED IN A LUST;
RELEASE TO SOIL; WASTE OIL PRESENT;

OTHER CONTAMINATION:
OTHER RELEASES:
OTHER PROBLEMS:
OTHER TYPE OF SITE:

SITE ACTIONS:

TS DATE: 2/21/97
RA STATUS:
AUL DATE:
LSP: BRACKETT

RAS TYPE: RAO
RAO CLASS: A-2
AUL RESTRICTION: NON

TS DATE: 10/15/96
RA STATUS: SOW
AUL DATE:
LSP: BRACKETT

RAS TYPE: PHASEII
RAO CLASS:
AUL RESTRICTION:

Environmental FirstSearch
Site Detail Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 22 **DIST/DIR:** 0.29 NE **MAP ID:** 19

NAME: HAMPDEN POWER PLANT SITE
ADDRESS: DEPOT ST.
CHICOPEE MA 01013

REV: 05/10/00
ID1: 1-0000038
ID2:
STATUS: TIER 1A
PHONE:

CONTACT:

LTBI: 4/15/87 **CONFIRMED:** 7/15/87 **DELETED:** **REMOVED:**

SITE INFORMATION:

INITIATED: SAB
ACTION BY: RP ONLY

CURRENT STATUS: PHASE 2
SITE STATUS: TIER 1A

ACTION TAKEN (REM CODE):
REQ TYPE:

REQ DUE:

SITE DESCRIPTION: AIR RELEASE; FORMER; GROUNDWATER RELEASE; LANDFILL; PETROLEUM PRESENT;
RELEASE TO SOIL;

OTHER CONTAMINATION:
OTHER RELEASES:
OTHER PROBLEMS:
OTHER TYPE OF SITE:

SITE ACTIONS:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 25 **DIST/DIR:** 0.41 SW **MAP ID:** 9

NAME: PRIDE CITGO
ADDRESS: 1247 RIVERDALE STREET
WEST SPRINGFIELD MA 01089

REV: 05/10/00
ID1: 1-0011709
ID2:
STATUS:
PHONE:

CONTACT:

LTBI: **CONFIRMED:** **DELETED:** **REMOVED:**

SITE INFORMATION:

INITIATED: **CURRENT STATUS:**
ACTION BY: **SITE STATUS:**

ACTION TAKEN (REM CODE):
REQ TYPE: **REQ DUE:**

SITE DESCRIPTION:
SITE ACTIONS:

TS DATE: 3/9/98 **RAS TYPE:** FEND
RA STATUS: TRANS **RAO CLASS:**
AUL DATE: **AUL RESTRICTION:**
LSP:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 27 **DIST/DIR:** 0.23 SW **MAP ID:** 23

NAME: PROPERTY
ADDRESS: 35 WAYSIDE AVE.
WEST SPRINGFIELD MA 01089

REV: 05/10/00
ID1: 1-0000464
ID2:
STATUS: NFA
PHONE:

CONTACT:

LTBI: 10/15/88 **CONFIRMED:** **DELETED:** **REMOVED:**

SITE INFORMATION:

INITIATED: SAB
ACTION BY:

CURRENT STATUS: P.A. L
SITE STATUS: NFA

ACTION TAKEN (REM CODE):
REQ TYPE:

REQ DUE:

SITE DESCRIPTION:
SITE ACTIONS:

TS DATE: 7/19/96
RA STATUS:
AUL DATE:
LSP:

RAS TYPE: DEP-NFA
RAO CLASS:
AUL RESTRICTION:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE

SEARCH ID: 28 DIST/DIR: 0.34 NW MAP ID: 6

NAME: REDS EXXON
ADDRESS: 1528 RIVERDALE ST
WEST SPRINGFIELD MA 01089

REV: 05/10/00
ID1: 1-0000898
ID2:
STATUS: RAO
PHONE:

CONTACT:

LTBI: 7/15/91 CONFIRMED: 7/15/91 DELETED: REMOVED:

SITE INFORMATION:

INITIATED: ERB
ACTION BY: RP ONLY

CURRENT STATUS: PHASE 2
SITE STATUS: RAO

ACTION TAKEN (REM CODE):
REQ TYPE:

REQ DUE:

SITE DESCRIPTION: GAS STATION; GROUNDWATER RELEASE; GASOLINE PRESENT; CONTAINED IN A LUST;
PETROLEUM PRESENT; RELEASE TO SOIL;

OTHER CONTAMINATION:

OTHER RELEASES:
OTHER PROBLEMS:
OTHER TYPE OF SITE:

SITE ACTIONS:

TS DATE: 4/25/96
RA STATUS:
AUL DATE:
LSP:

RAS TYPE: RAO
RAO CLASS: A-2
AUL RESTRICTION: NON

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SITE					
SEARCH ID:	30	DIST/DIR:	0.14 SW	MAP ID:	11
NAME:	SANFORD TOOL AND DESIGN		REV:	05/10/00	
ADDRESS:	79 WAYSIDE AVE.		ID1:	1-0000710	
	WEST SPRINGFIELD MA 01089		ID2:		
CONTACT:			STATUS:	NFA	
			PHONE:		
LTBI:	1/15/90	CONFIRMED:	10/15/91	DELETED:	
				REMOVED:	
SITE INFORMATION:					
INITIATED:	UNSL	CURRENT STATUS:	PHASE 2		
ACTION BY:	RP ONLY	SITE STATUS:	NFA		
ACTION TAKEN (REM CODE):					
REQ TYPE:		REQ DUE:			
SITE DESCRIPTION:					
SITE ACTIONS:					

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 32 **DIST/DIR:** 0.25 SE **MAP ID:** 26

NAME: ED SYPEK CONSTRUCTION
ADDRESS: 154 ASHLEY AVE
WEST SPRINGFIELD MA

REV: 06/09/00
ID1: 1-0012655
ID2:
STATUS: 72 HR
PHONE:

CONTACT:

RELEASE NOTIFICATION DATE: 10/23/98

RELEASE SOURCE: UST

TYPE OF CHEMICAL RELEASED: GASOLINE
AMOUNT RELEASED: 156 PPMV

TYPE OF PROPERTY: COMMERCIAL

ACTION TAKEN: Immediate Response Action
ACTION STATUS: Oral Approval of Plan

ACTION DATE: 10/23/1998

TYPE OF RESPONSE ACT. OUTCOME:

ACTIVITY USE LIMITATION:

LSP ID NUMBER: 6135

ACTION TAKEN: Response Action Outcome
ACTION STATUS: RAO Statement Received

ACTION DATE: 12/22/1998

TYPE OF RESPONSE ACT. OUTCOME: A1 - A PERMANENT SOLUTION HAS BEEN ACHIEVED: CONTAMINATION HAS BEEN REDUCED TO BACKGROUND OR A THREAT OF A RELEASE HAS BEEN ELIMINATED

ACTIVITY USE LIMITATION:

LSP ID NUMBER: 9908

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 33 **DIST/DIR:** 0.16 SW **MAP ID:** 27

NAME: MICHAEL S WHOLESALE BAIT
ADDRESS: WAYSIDE AVENUE
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: BOURCIER, J

REV:
ID1: W93-0264
ID2: 0000
STATUS:
PHONE:

CASE CLOSED? YES
SPILL DATE:
DATE REPORTED: 19930526
SPILL NOTIFIER: ANONYMOUS

SPILL TIME:
REPORT TIME: 10:00PM
NOTIFIER PHONE:

SPILL DESCRIPTION:

INCIDENT:	OTHER RELEASE > POSSIBLE VAPORS		
MATERIAL SPILLED:	OTHER MATERIAL -->		
AMT RPTD SPILLED:	UNKNOWN -----	ACTUAL AMT SPILLED:	UNKNOWN -----
SOURCE OF SPILL:	OTHER SOURCE > UNKNOWN		
PET/HAZ:	HAZARDOUS	VIR/WASTE:	-----
PCB LEVEL:	UNKNOWN		

ENVIRONMENTAL IMPACT:

LUST?: NO
CONTRACTOR: NOT USED
DAYS/CLOSE: 0

SOIL CONTAMINATED?:
PREPARE REPORT:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 34 **DIST/DIR:** 0.16 SW **MAP ID:** 27

NAME: MIKE S WHOLESALE BAIT
ADDRESS: 74 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV:
ID1: W93-0274
ID2: 0000
STATUS:
PHONE:

CONTACT: BOURCIER, J

CASE CLOSED? YES
SPILL DATE:
DATE REPORTED: 19930528
SPILL NOTIFIER: ANONYMOUS

SPILL TIME:
REPORT TIME:
NOTIFIER PHONE:

SPILL DESCRIPTION:

INCIDENT: -----
MATERIAL SPILLED: ACID (MISCELLANEOUS)
AMT RPTD SPILLED: UNKNOWN -----
SOURCE OF SPILL: -----
PET/HAZ: HAZARDOUS
PCB LEVEL: -----

ACTUAL AMT SPILLED: UNKNOWN -----
VIR/WASTE: -----

ENVIRONMENTAL IMPACT:

LUST?: NO
CONTRACTOR: NOT USED
DAYS/CLOSE: 0

SOIL CONTAMINATED?:
PREPARE REPORT:

Environmental FirstSearch
Site Detail Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 35 DIST/DIR: 0.00 -- MAP ID: 1

NAME: OR DIESEL SPILL
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089

REV:
ID1: W92-0676
ID2: 0000
STATUS:
PHONE:

CONTACT: CARPENTER, C

CASE CLOSED? YES
SPILL DATE: 19921201 SPILL TIME: 08:30AM
DATE REPORTED: 19921201 REPORT TIME: 10:15AM
SPILL NOTIFIER: DAN C, OIL RECOVERY NOTIFIER PHONE:

SPILL DESCRIPTION:

INCIDENT: SPILL
MATERIAL SPILLED: DIESEL FUEL
AMT RPTD SPILLED: 11-50 GALLONS ACTUAL AMT SPILLED: 11-50 GALLONS
SOURCE OF SPILL: VEH. FUEL TANK
PET/HAZ: PETROLEUM VIR/WASTE: VIRGIN
PCB LEVEL: NONE

ENVIRONMENTAL IMPACT:

LUST?: NO SOIL CONTAMINATED?:
CONTRACTOR: NOT USED PREPARE REPORT:
DAYS/CLOSE: 3

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 36 **DIST/DIR:** 0.14 SW **MAP ID:** 28

NAME: STORM DRAIN
ADDRESS: CORNER OF DOTY CIRCLE/WAYSIDE
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: CARPENTER, C

REV:
ID1: W91-0504
ID2: 0000
STATUS:
PHONE:

CASE CLOSED? YES
SPILL DATE: 19910801
DATE REPORTED: 19910829
SPILL NOTIFIER: BILL VERDONE-EPA

SPILL TIME:
REPORT TIME: 04:15PM
NOTIFIER PHONE:

SPILL DESCRIPTION:

INCIDENT: DUMPING
MATERIAL SPILLED: OTHER MATERIAL -->
AMT RPTD SPILLED: UNKNOWN GALLONS
SOURCE OF SPILL: TANKER TRUCK
PET/HAZ: UNKNOWN
PCB LEVEL: NONE

ACTUAL AMT SPILLED: UNKNOWN GALLONS
VIR/WASTE: WASTE

ENVIRONMENTAL IMPACT:

LUST?: NO
CONTRACTOR: NOT USED
DAYS/CLOSE: 1

SOIL CONTAMINATED?:
PREPARE REPORT:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 37 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UNITED PARCEL SERVICE
ADDRESS: 120 WAYSIDE AVENUE
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: FISH, B

REV:
ID1: W91-0542
ID2: 0000
STATUS:
PHONE:

CASE CLOSED? YES
SPILL DATE: 19910923
DATE REPORTED: 19910923
SPILL NOTIFIER: JOHN FRESCHLIN- GTI
SPILL TIME:
REPORT TIME: 11:10AM
NOTIFIER PHONE:

SPILL DESCRIPTION:

INCIDENT: LEAK
MATERIAL SPILLED: GASOLINE
AMT RPTD SPILLED: UNKNOWN GALLONS
SOURCE OF SPILL: U.S.T.
PET/HAZ: PETROLEUM
PCB LEVEL: NONE
ACTUAL AMT SPILLED: UNKNOWN GALLONS
VIR/WASTE: VIRGIN

ENVIRONMENTAL IMPACT: SOIL

LUST?: YES
CONTRACTOR: NOT USED
DAYS/CLOSE: 347
SOIL CONTAMINATED?:
PREPARE REPORT:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 38 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UNITED PARCEL SERVICES
ADDRESS: 120 WAYSIDE AVENUE
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: CARPENTER, C

REV:
ID1: W90-0694
ID2: 0000
STATUS:
PHONE:

CASE CLOSED? YES
SPILL DATE: 19901030 **SPILL TIME:** 11:00PM
DATE REPORTED: 19901030 **REPORT TIME:** 10:35AM
SPILL NOTIFIER: BOB ROUKER - PLANT ENGINEER **NOTIFIER PHONE:**

SPILL DESCRIPTION:

INCIDENT:	OVERFILL	
MATERIAL SPILLED:	DIESEL FUEL	
AMT RPTD SPILLED:	10-50 GALLONS	ACTUAL AMT SPILLED: -----
SOURCE OF SPILL:	VEH. FUEL TANK	
PET/HAZ:	PETROLEUM	VIR/WASTE: VIRGIN
PCB LEVEL:	NONE	

ENVIRONMENTAL IMPACT:

LUST?:	NO	SOIL CONTAMINATED?:
CONTRACTOR:	NOT USED	PREPARE REPORT:
DAYS/CLOSE:	90	

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 39 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UPS
ADDRESS: 120 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV:
ID1: W92-0472
ID2: 0000
STATUS:
PHONE:

CONTACT: FISH, B

CASE CLOSED? YES
SPILL DATE:
DATE REPORTED: 19920826
SPILL NOTIFIER: GROUNDWATER TECHNOLOGY

SPILL TIME:
REPORT TIME:
NOTIFIER PHONE:

SPILL DESCRIPTION:

INCIDENT: OTHER RELEASE > DISCHARGE
MATERIAL SPILLED: OTHER MATERIAL -->
AMT RPTD SPILLED: UNKNOWN GALLONS **ACTUAL AMT SPILLED:** UNKNOWN GALLONS
SOURCE OF SPILL: OTHER SOURCE > FLOOR DRAINS
PET/HAZ: BOTH **VIR/WASTE:** -----
PCB LEVEL: UNKNOWN

ENVIRONMENTAL IMPACT: SOIL

LUST?: NO **SOIL CONTAMINATED?:**
CONTRACTOR: NOT USED **PREPARE REPORT:**
DAYS/CLOSE: 0

Environmental FirstSearch
Site Detail Report

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS SITE

SEARCH ID: 40 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UPS FACILITY
ADDRESS: 120 WAYSIDE AVE
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: BOURCIER, J

REV:
ID1: W93-0427
ID2: 0000
STATUS:
PHONE:

CASE CLOSED? YES
SPILL DATE: 19930806 **SPILL TIME:** 01:00PM
DATE REPORTED: 19930806 **REPORT TIME:** 01:15PM
SPILL NOTIFIER: RALPH DANFORTH/WEST SPRINGFIELD FD **NOTIFIER PHONE:**

SPILL DESCRIPTION:

INCIDENT: TANK REMOVAL
MATERIAL SPILLED: DIESEL FUEL
AMT RPTD SPILLED: UNKNOWN -----
SOURCE OF SPILL: BELOW-GRND TANK
PET/HAZ: PETROLEUM
PCB LEVEL: -----

ACTUAL AMT SPILLED: -----
VIR/WASTE: VIRGIN

ENVIRONMENTAL IMPACT: SOIL

LUST?: ---
CONTRACTOR: NOT USED
DAYS/CLOSE: 0

SOIL CONTAMINATED?:
PREPARE REPORT:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS 80's SITE

SEARCH ID: 41 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME:
ADDRESS: 120 WAYSIDE AVE
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: PILEGI, S

REV:
ID1: W89-0269
ID2: 0000
STATUS:
PHONE:

SPILL DATE: 19890606
DATE REPORTED: 19890606
SPILL NOTIFIER: HELEN ROCKLIFFE

SPILL TIME:
REPORT TIME: 11:55AM
NOTIFIER PHONE:

INCIDENT: LEAK
MATERIAL SPILLED: DIESEL FUEL
AMT RPTD SPILLED: UNKNOWN
SOURCE OF SPILL: U.S.T.
PET/HAZ: PETROLEUM
PCB LEVEL:

ACTUAL AMT SPILLED: UNKNOWN
VIR/WASTE: VIRGIN

ENVIRONMENTAL IMPACT: SOIL

LUST?:
CONTRACTOR: NOT USED
DAYS/CLOSE: 1

SOIL CONTAMINATED?:
PREPARE REPORT:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

STATE SPILLS 80's SITE

SEARCH ID: 42 **DIST/DIR:** 0.13 SE **MAP ID:** 29

NAME:
ADDRESS: ASHLEY AVE & WAYSIDE AVE
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: PILEGI, S

REV:
ID1: W89-0153
ID2: 0000
STATUS:
PHONE:

SPILL DATE: 19890405
DATE REPORTED: 19890405
SPILL NOTIFIER: HENRY BUKEK

SPILL TIME:
REPORT TIME:
NOTIFIER PHONE:

INCIDENT: SPILL
MATERIAL SPILLED: DIESEL FUEL
AMT RPTD SPILLED: 10-50 GALLONS
SOURCE OF SPILL: PIPE/HOSE/LINE
PET/HAZ: PETROLEUM
PCB LEVEL: NONE

ACTUAL AMT SPILLED: _____

VIR/WASTE: VIRGIN

ENVIRONMENTAL IMPACT:

LUST?: NO
CONTRACTOR: NOT USED
DAYS/CLOSE: 1

SOIL CONTAMINATED?:
PREPARE REPORT:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 43 **DIST/DIR:** 0.15 NW **MAP ID:** 30

NAME: BRINKS INC
ADDRESS: 35 DOTY CIR
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-007764
ID2:
STATUS:
PHONE:

CONTACT: BRINKS INC

TOTAL NUMBER OF TANKS: 1

OWNER INFORMATION

OWNER NAME: BRINKS INC
OWNER ADDRESS: 35 DOTY CIR
WEST SPRINGFIELD MA 01089
OWNER TELEPHONE: (413) 733-6685
OWNER TYPE: Private

FACILITY INSURANCE INFORMATION

COMMERCIAL INSURANCE?: NO
SELF INSURED?: NO
RISK RETENTION GROUP RESPONSIBILITY?: NO
GUARANTEE FINANCIAL RESPONSIBILITY?: NO
TRUST FUND FINANCIAL RESPONSIBILITY?: NO
SURETY BOND FINANCIAL RESPONSIBILITY?: NO
STATE FUND FINANCIAL RESPONSIBILITY?: NO
OTHER TYPES OF INSURANCE: Normal

FACILITY GROUNDWATER INFORMATION

WITHIN DRINKING SUPPLY PROTECTION AREA?: NO
WITHIN A WELLHEAD PROTECTION AREA?: NO
WITHIN 100 FEET OF A WETLAND?: NO
WITHIN 300 FEET OF A BODY OF WATER?: NO
TOWN FIRE DEPARTMENT CODE: 13325

TANK NUMBER: 1
TANK STATUS: Removed
CONTENTS: Diesel
DATE INSTALLED: 5/7/70 0:00:00
DATE REMOVED:

PIPE STATUS:
CAPACITY: 4000 GALLONS
DATE LAST USED: 9/8/88 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 44 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: COMMERCIAL DISPOSAL CO.
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: NANCY FRATONI

REV: 06/09/99
ID1: 0-007816
ID2:
STATUS:
PHONE: (413) 737-1129

TOTAL NUMBER OF TANKS: 5

OWNER INFORMATION

OWNER NAME: COMMERCIAL DISPOSAL CO., INC.
OWNER ADDRESS: 115 WAYSIDE / 17 TOWNWAY
SPRINGFIELD MA 01089
OWNER TELEPHONE: (413) 737-1129
OWNER TYPE: Private

FACILITY INSURANCE INFORMATION

COMMERCIAL INSURANCE?: NO
SELF INSURED?: NO
RISK RETENTION GROUP RESPONSIBILITY?: NO
GUARANTEE FINANCIAL RESPONSIBILITY?: NO
TRUST FUND FINANCIAL RESPONSIBILITY?: NO
SURETY BOND FINANCIAL RESPONSIBILITY?: NO
STATE FUND FINANCIAL RESPONSIBILITY?: NO
OTHER TYPES OF INSURANCE: Normal

FACILITY GROUNDWATER INFORMATION

WITHIN DRINKING SUPPLY PROTECTION AREA?: NO
WITHIN A WELLHEAD PROTECTION AREA?: NO
WITHIN 100 FEET OF A WETLAND?: NO
WITHIN 300 FEET OF A BODY OF WATER?: NO
TOWN FIRE DEPARTMENT CODE: 13325

TANK NUMBER: 1
TANK STATUS: Removed
CONTENTS: Diesel
DATE INSTALLED: 5/1/73
DATE REMOVED:

PIPE STATUS:
CAPACITY: 10000 GALLONS
DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 2
TANK STATUS: Removed
CONTENTS: Gasoline
DATE INSTALLED: 5/1/65
DATE REMOVED:

PIPE STATUS:
CAPACITY: 3000 GALLONS
DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO

- Continued on next page -

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 44 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: COMMERCIAL DISPOSAL CO.
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: NANCY FRATONI

REV: 06/09/99
ID1: 0-007816
ID2:
STATUS:
PHONE: (413) 737-1129

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 3
TANK STATUS: Removed
CONTENTS:
DATE INSTALLED: 5/1/73
DATE REMOVED:
PIPE STATUS:
CAPACITY: 1000 GALLONS
DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 4
TANK STATUS: Removed
CONTENTS:
DATE INSTALLED: 5/1/73
DATE REMOVED:
PIPE STATUS:
CAPACITY: 1000 GALLONS
DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel

- Continued on next page -

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 44 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: COMMERCIAL DISPOSAL CO.
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089
HAMPDEN
CONTACT: NANCY FRATONI

REV: 06/09/99
ID1: 0-007816
ID2:
STATUS:
PHONE: (413) 737-1129

PIPE MATERIAL/CONSTRUCTION:

IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 5
TANK STATUS: Removed
CONTENTS: Waste Oil
DATE INSTALLED: 5/1/73
DATE REMOVED:

PIPE STATUS:
CAPACITY: 1000 GALLONS
DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 45 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: COMMERCIAL DISPOSAL COMPANY INC
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-030081
ID2:
STATUS:
PHONE: (413) 737-1129

CONTACT: DONALD FAUCHE

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO

DEP TRACKING NUMBER:

TANK LEAK DETECTION METHOD: Interstitial Monitoring

PIPING LEAK DETECTION METHOD: Suction: Check Valve at Dispenser

TANK MATERIAL/CONSTRUCTION: Cathodically Protected Steel Double Walled

PIPE MATERIAL/CONSTRUCTION: Cathodically Protected Steel Single Walled

IS TANK LINED?: NO

DOES TANK HAVE EXCAVATION LINER?: NO

INSTALL INSPTD BY ENGINEER?: NO

INSTALL INSPTD BY IMPLEMENTING AGCY?: NO

DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 3

TANK STATUS: In Use

CONTENTS: Other

DATE INSTALLED: 9/9/89 0:00:00

DATE REMOVED:

PIPE STATUS:

CAPACITY: 1000 GALLONS

DATE LAST USED:

HAS LEAK EVER BEEN DETECTED?: NO

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO

DEP TRACKING NUMBER:

TANK LEAK DETECTION METHOD: Interstitial Monitoring

PIPING LEAK DETECTION METHOD: Suction: Check Valve at Dispenser

TANK MATERIAL/CONSTRUCTION: Cathodically Protected Steel Double Walled

PIPE MATERIAL/CONSTRUCTION: Cathodically Protected Steel Single Walled

IS TANK LINED?: NO

DOES TANK HAVE EXCAVATION LINER?: NO

INSTALL INSPTD BY ENGINEER?: NO

INSTALL INSPTD BY IMPLEMENTING AGCY?: NO

DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 4

TANK STATUS: Removed

CONTENTS: Diesel

DATE INSTALLED: 5/1/73 0:00:00

DATE REMOVED:

PIPE STATUS:

CAPACITY: 10000 GALLONS

DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO

DEP TRACKING NUMBER:

TANK LEAK DETECTION METHOD:

PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel

- Continued on next page -

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 45 **DIST/DIR:** 0.00 -- **MAP ID:** 1

NAME: COMMERCIAL DISPOSAL COMPANY INC
ADDRESS: 17 TOWN WAY
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-030081
ID2:
STATUS:
PHONE: (413) 737-1129

CONTACT: DONALD FAUCHE

PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 5
TANK STATUS: Removed
CONTENTS: Gasoline
DATE INSTALLED: 5/1/65 0:00:00
DATE REMOVED:

PIPE STATUS:
CAPACITY: 3000 GALLONS
DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 6
TANK STATUS: Removed
CONTENTS:
DATE INSTALLED: 5/1/73 0:00:00
DATE REMOVED:

PIPE STATUS:
CAPACITY: 1000 GALLONS
DATE LAST USED: 12/30/89 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION:
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

- More Details Exist For This Site; Max Page Limit Reached -

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 46 **DIST/DIR:** 0.25 SE **MAP ID:** 26

NAME: EDWARD S SYPEK
ADDRESS: 154 ASHELY AVE
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-007765
ID2:
STATUS:
PHONE: (413) 788-0256

CONTACT: MARY SYPEK

TOTAL NUMBER OF TANKS: 2

OWNER INFORMATION

OWNER NAME: EDWARD S SYPEK
OWNER ADDRESS: 186 ASHLEY AVE
WEST SPRINGFIELD MA 01089
OWNER TELEPHONE: (413) 788-0256
OWNER TYPE: Private

FACILITY INSURANCE INFORMATION

COMMERCIAL INSURANCE?: NO
SELF INSURED?: NO
RISK RETENTION GROUP RESPONSIBILITY?: NO
GUARANTEE FINANCIAL RESPONSIBILITY?: NO
TRUST FUND FINANCIAL RESPONSIBILITY?: NO
SURETY BOND FINANCIAL RESPONSIBILITY?: NO
STATE FUND FINANCIAL RESPONSIBILITY?: NO
OTHER TYPES OF INSURANCE:

FACILITY GROUNDWATER INFORMATION

WITHIN DRINKING SUPPLY PROTECTION AREA?: NO
WITHIN A WELLHEAD PROTECTION AREA?: NO
WITHIN 100 FEET OF A WETLAND?: NO
WITHIN 300 FEET OF A BODY OF WATER?: NO
TOWN FIRE DEPARTMENT CODE: 13325

TANK NUMBER: 1
TANK STATUS: Removed
CONTENTS: Diesel
DATE INSTALLED: 5/8/76 0:00:00
DATE REMOVED: 10/23/98 0:00:00

PIPE STATUS: Removed
CAPACITY: 4000 GALLONS
DATE LAST USED: 10/23/98 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION: Bare Steel
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCV?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 2
TANK STATUS: Removed
CONTENTS: Gasoline
DATE INSTALLED: 5/8/76 0:00:00
DATE REMOVED: 10/23/98 0:00:00

PIPE STATUS: Removed
CAPACITY: 4000 GALLONS
DATE LAST USED: 10/23/98 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO

- Continued on next page -

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 46 **DIST/DIR:** 0.25 SE **MAP ID:** 26

NAME: EDWARD S SYPEK
ADDRESS: 154 ASHELY AVE
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-007765
ID2:
STATUS:
PHONE: (413) 788-0256

CONTACT: MARY SYPEK

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO

DEP TRACKING NUMBER:

TANK LEAK DETECTION METHOD:

PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel

PIPE MATERIAL/CONSTRUCTION: Bare Steel

IS TANK LINED?: NO

DOES TANK HAVE EXCAVATION LINER?: NO

INSTALL INSPTD BY ENGINEER?: NO

INSTALL INSPTD BY IMPLEMENTING AGCY?: NO

DATE OF LAST TIGHTNESS TEST:

Environmental FirstSearch *Site Detail Report*

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 47 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UNITED PARCEL SERVICE
ADDRESS: 120 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-007822
ID2:
STATUS:
PHONE: (508) 561-9131

CONTACT: ANDY TEKLITS

TOTAL NUMBER OF TANKS: 6

OWNER INFORMATION

OWNER NAME: SPRINGFIELD WET INC
OWNER ADDRESS: 1700 W PARK DR PO BOX 1184
WESTBOROUGH MA 01581
OWNER TELEPHONE: (508) 561-6131
OWNER TYPE: Private

FACILITY INSURANCE INFORMATION

COMMERCIAL INSURANCE?: NO
SELF INSURED?: YES
RISK RETENTION GROUP RESPONSIBILITY?: NO
GUARANTEE FINANCIAL RESPONSIBILITY?: NO
TRUST FUND FINANCIAL RESPONSIBILITY?: NO
SURETY BOND FINANCIAL RESPONSIBILITY?: NO
STATE FUND FINANCIAL RESPONSIBILITY?: NO
OTHER TYPES OF INSURANCE: Normal

FACILITY GROUNDWATER INFORMATION

WITHIN DRINKING SUPPLY PROTECTION AREA?: NO
WITHIN A WELLHEAD PROTECTION AREA?: NO
WITHIN 100 FEET OF A WETLAND?: NO
WITHIN 300 FEET OF A BODY OF WATER?: NO
TOWN FIRE DEPARTMENT CODE: 13325

TANK NUMBER: 3
TANK STATUS: Removed
CONTENTS: Diesel
DATE INSTALLED: 4/23/68 0:00:00
DATE REMOVED:

PIPE STATUS: Removed
CAPACITY: 8000 GALLONS
DATE LAST USED: 9/23/91 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD:
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION: Bare Steel
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 4
TANK STATUS: Removed
CONTENTS: Gasoline
DATE INSTALLED: 4/23/68 0:00:00
DATE REMOVED: 9/23/91 0:00:00

PIPE STATUS: Removed
CAPACITY: 4000 GALLONS
DATE LAST USED: 9/23/91 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO

- Continued on next page -

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 47 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UNITED PARCEL SERVICE
ADDRESS: 120 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-007822
ID2:
STATUS:
PHONE: (508) 561-9131

CONTACT: ANDY TEKLITS

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO

DEP TRACKING NUMBER:

TANK LEAK DETECTION METHOD:

PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION: Bare Steel
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 5
TANK STATUS: Removed
CONTENTS: Gasoline
DATE INSTALLED: 4/23/68 0:00:00
DATE REMOVED: 9/23/91 0:00:00

PIPE STATUS: Removed
CAPACITY: 4000 GALLONS
DATE LAST USED: 9/23/91 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO

DEP TRACKING NUMBER:

TANK LEAK DETECTION METHOD:

PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel
PIPE MATERIAL/CONSTRUCTION: Bare Steel
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 6
TANK STATUS: In Use
CONTENTS: Gasoline
DATE INSTALLED: 9/23/91 0:00:00
DATE REMOVED:

PIPE STATUS: In Use
CAPACITY: 10000 GALLONS
DATE LAST USED:

HAS LEAK EVER BEEN DETECTED?: NO

IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO

DEP TRACKING NUMBER:

TANK LEAK DETECTION METHOD: Interstitial Monitoring

PIPING LEAK DETECTION METHOD: Interstitial Space Monitor

TANK MATERIAL/CONSTRUCTION: Fiberglass Reinforced Plastic Double Walled

- Continued on next page -

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 47 **DIST/DIR:** 0.10 SW **MAP ID:** 7

NAME: UNITED PARCEL SERVICE
ADDRESS: 120 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-007822
ID2:
STATUS:
PHONE: (508) 561-9131

CONTACT: ANDY TEKLITS

PIPE MATERIAL/CONSTRUCTION: Fiberglass Reinforced Plastic Double Walled
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 7
TANK STATUS: In Use
CONTENTS: Gasoline
DATE INSTALLED: 9/23/91 0:00:00
DATE REMOVED:
PIPE STATUS: In Use
CAPACITY: 10000 GALLONS
DATE LAST USED:

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD: Interstitial Monitoring
PIPING LEAK DETECTION METHOD: Interstitial Space Monitor

TANK MATERIAL/CONSTRUCTION: Fiberglass Reinforced Plastic Double Walled
PIPE MATERIAL/CONSTRUCTION: Fiberglass Reinforced Plastic Double Walled
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

TANK NUMBER: 8
TANK STATUS: In Use
CONTENTS: Diesel
DATE INSTALLED: 9/23/91 0:00:00
DATE REMOVED:
PIPE STATUS: In Use
CAPACITY: 15000 GALLONS
DATE LAST USED:

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD: Interstitial Monitoring
PIPING LEAK DETECTION METHOD: Interstitial Space Monitor

TANK MATERIAL/CONSTRUCTION: Fiberglass Reinforced Plastic Double Walled
PIPE MATERIAL/CONSTRUCTION: Fiberglass Reinforced Plastic Double Walled
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPTD BY ENGINEER?: NO
INSTALL INSPTD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 115 WAYSIDE AVE
WEST SPRINGFIELD MA 01089

JOB: 13997

REGISTERED UNDERGROUND STORAGE TANKS

SEARCH ID: 48 **DIST/DIR:** NON GC **MAP ID:**

NAME: WAYSIDE AVENUE DIKE STATION
ADDRESS: OFF WAYSIDE AVE
WEST SPRINGFIELD MA 01089

REV: 03/29/00
ID1: 0-000978
ID2:
STATUS:
PHONE: (413) 263-3246

CONTACT: RAYMOND BROUILLETTE

TOTAL NUMBER OF TANKS: 1

OWNER INFORMATION

OWNER NAME: TOWN OF WEST SPRINGFIELD DPW
OWNER ADDRESS: 26 CENTRAL ST
WEST SPRINGFIELD MA 01089
OWNER TELEPHONE: (413) 263-3240
OWNER TYPE: Local

FACILITY INSURANCE INFORMATION

COMMERCIAL INSURANCE?: NO
SELF INSURED?: YES
RISK RETENTION GROUP RESPONSIBILITY?: NO
GUARANTEE FINANCIAL RESPONSIBILITY?: NO
TRUST FUND FINANCIAL RESPONSIBILITY?: NO
SURETY BOND FINANCIAL RESPONSIBILITY?: NO
STATE FUND FINANCIAL RESPONSIBILITY?: NO
OTHER TYPES OF INSURANCE:

FACILITY GROUNDWATER INFORMATION

WITHIN DRINKING SUPPLY PROTECTION AREA?: NO
WITHIN A WELLHEAD PROTECTION AREA?: NO
WITHIN 100 FEET OF A WETLAND?: NO
WITHIN 300 FEET OF A BODY OF WATER?: YES
TOWN FIRE DEPARTMENT CODE: 13325

TANK NUMBER: 1
TANK STATUS: Removed
CONTENTS: Gasoline
DATE INSTALLED: 1/1/46 0:00:00
DATE REMOVED: 11/17/98 0:00:00

PIPE STATUS: Removed
CAPACITY: 500 GALLONS
DATE LAST USED: 11/17/98 0:00:00

HAS LEAK EVER BEEN DETECTED?: NO
IF DETECTED, WAS DEP NOTIFIED OF LEAK?: NO
DEP TRACKING NUMBER:
TANK LEAK DETECTION METHOD: Inventory Record-Keeping
PIPING LEAK DETECTION METHOD:

TANK MATERIAL/CONSTRUCTION: Bare Steel Single Walled
PIPE MATERIAL/CONSTRUCTION: Bare Steel Single Walled
IS TANK LINED?: NO
DOES TANK HAVE EXCAVATION LINER?: NO
INSTALL INSPD BY ENGINEER?: NO
INSTALL INSPD BY IMPLEMENTING AGCY?: NO
DATE OF LAST TIGHTNESS TEST:

**Environmental FirstSearch
Federal Databases and Sources**

1. **NPL: National Priority List.** The EPA's list of confirmed or proposed Superfund sites.

Updated quarterly.

2. **CERCLIS: Comprehensive Environmental Response Compensation and Liability Information System.** The EPA's database of current and potential Superfund sites currently or previously under investigation.

Updated quarterly.

3. **RCRIS: Resource Conservation and Recovery Information System.** The EPA's database of registered hazardous waste generators and treatment, storage and disposal facilities. Included are RAATS (RCRA Administrative Action Tracking System) and CMEL (Compliance Monitoring & Enforcement List).

Updated quarterly.

4. **ERNS: Emergency Response Notification System.**
The EPA's database of EPA emergency response actions.

Updated quarterly.

5. **NPDES: National Pollution Discharge Elimination System.**
The EPA's database of all permitted facilities receiving and discharging effluents to and from the environment.

Updated semi-annually.

6. **FINDS: The Facility Index System.** The EPA's Index of identification numbers associated with a property or facility which the EPA has investigated or has been made aware of in conjunction with various regulatory programs. Each record indicates the EPA office that may have files on the site or facility.

Updated quarterly.

**Environmental FirstSearch
Massachusetts Databases and Sources**

1. **State Sites:** Confirmed Disposal Sites and Locations To Be Investigated. The Department of Environmental Protection Agency database of confirmed, LTBI, waiver, deleted and reserved sites maintained by the Bureau of Waste Site Cleanup.

Updated immediately upon release.

2. **Spills:** The Department of Environmental Protection Agency database of emergency response actions and spill releases maintained by the Bureau of Waste Site Cleanup.

Updated immediately upon release.

3. **Landfills:** The Department of Environmental Protection Agency database of active solid waste landfill facilities maintained by the Division of Solid Waste Management.

Updated annually.

4. **UST:** Underground Storage Tanks. The Department of Public Safety/Office of the Fire Marshall's database of registered underground storage tanks.

Updated semi-annually.

5. **FWS:** The Department of Environmental Protection Agency's database of public water supply well locations maintained by the Division of Water Supply and MassGIS.

Updated semi-annually.

6. **Aquifers:** The Executive Office of Environmental Affairs GIS database of high, medium and low yield aquifers, EPA sole source aquifers, known zone II boundaries for public water supplies and surface water.

Updated annually.

7. **ACEC:** Areas of Critical Environmental Concern. The Executive Office of Environmental Affairs GIS database of legislated ACECs, protected open spaces, estimated habitats of endangered species and vernal pools.

Updated annually.

Environmental FirstSearch
Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE: 115 WAYSIDE AVE
 WEST SPRINGFIELD MA 01089

JOB: 13997

Street Name	Dist/Dir	Street Name	Dist/Dir
Abbey St	0.52 SE	Home St	0.84 NE
Algonquin St	0.92 SE	Hooper Rd	0.98 NE
Althea St	0.73 NW	Howard St	0.71 NW
Amherst St	0.80 NW	I-391	0.42 NE
Annie s Way	0.95 NW	I-90	0.68 NW
Apple Ridge Rd	0.83 SW	I-91	0.58 SW
Arnold Ave	0.88 NW	Indian Park	0.93 SE
Ash St	0.70 NE	Joffre St	0.72 NE
Ashley Ave	0.13 SE	John Dr	0.98 NW
Bacon St	0.43 NW	Kennedy St	0.88 SE
Belvidere St	0.86 NW	Kimball St	0.45 SE
Beston St	0.61 SE	Labelle St	0.63 NW
Bill St	0.98 NE	Lemuel Ave	0.99 SE
Birch St	0.75 NW	Leonard St	0.43 NE
Blanchwood Ave	0.92 NW	Lina Ln	0.44 NW
Bradford Dr	0.92 SW	Lowell Pl	0.90 NE
Brightwater St	0.39 NW	Marion St	0.99 SE
Broadcast Ct	0.87 NE	Market Sq	0.79 NE
Brush Hill Ave	0.36 NW	Massasoit Ave	0.51 NW
Bullens St	0.54 NE	Mc Keag Ave	0.64 NE
Burton St	0.64 SE	Medina St	0.62 NW
Cabot St	0.73 NE	Miller St	0.79 NE
Canal St	0.95 NE	Mountain Ave	0.83 NW
Capital Dr	0.36 SW	Myron St	0.84 SW
Captain Mac St	0.88 SE	Niles St	0.54 NW
Casino Ave	0.88 SE	Nonotuck Ave	0.77 NE
Center St	0.57 SE	Normandeau St	0.42 NW
Chapin St	0.78 SE	Oglore St	0.82 NW
Chapman St	0.84 NE	Old Chicopee St	0.88 NE
Chester St	0.96 NE	Old Field Rd	0.78 NE
Chestnut St	0.57 NE	Orange St	0.58 NW
Chicopee St	0.88 NE	Paderewski St	0.75 NE
Clara St	0.69 NW	Pajak St	0.98 NE
Clayton Dr	0.82 SW	Park St	0.57 SE
Clinton St	0.87 NE	Parkwood Dr	0.86 NW
Clover Ave	0.86 NE	Parshley Ave	0.99 NE
Coleridge Pl	0.91 NE	Parshley St	0.99 NE
Conn River Brg	0.16 SE	Peace St	0.95 NW
Connecticut Ave	0.45 NW	Pearl St	0.91 NE
Coolidge Rd	0.96 NE	Perkins St	0.71 NE
Cooney Pl	0.61 NE	Plante Cir	0.73 SE
Craig Dr	0.85 SW	Pleasant St	0.88 NE
Daggett Dr	0.77 SE	Polaski Ave	0.84 NW
Dana Ave	0.84 NW	Pulaski St	0.69 NW
Delaney Ave	0.88 NE	Railroad Row	0.37 NE
Depot St	0.43 NE	Riverdale St	0.29 SW
Dix Ave	0.93 NE	Riverview Ave	0.79 NW
Doty Cir	0.13 SW	Sachem St	0.94 SE

Environmental FirstSearch
Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE: 115 WAYSIDE AVE
 WEST SPRINGFIELD MA 01089

JOB: 13997

Street Name	Dist/Dir	Street Name	Dist/Dir
Dublin St	0.48 SE	Sanford St	0.91 SE
Dwight Ct	0.67 NE	School St	0.53 NE
Dwight St	0.63 NE	Skyline Dr	0.88 SW
Dwight Ter	0.92 NE	Sobieski Ave	0.68 NW
Ellsbree St	0.97 SE	South St	0.65 SE
Elm St	1.00 NE	Spring St	0.88 NE
Emerald St	0.43 SE	Springfield St	0.83 NE
Exchange St	0.33 NE	Spruce St	0.57 NE
Fairview Ave	0.99 NE	Squire Dr	0.84 SW
Falvey St	0.96 SW	Stearns Ter	0.98 SE
Ferry Ave	0.15 SE	Stonina Dr	0.70 SE
Foss Ave	0.97 NE	Trafton St	0.78 NE
Frederick St	0.75 NW	Tremont St	0.51 SE
Freida St	0.77 NW	Truro St	0.96 NE
Front St	0.43 NE	Union St	0.73 NE
Gaspee St	0.80 NE	Victorian Dr	0.89 NW
Gilmore St	0.77 NE	Wayfield Ave	0.73 NE
Gonet St	0.94 NE	Wayside Ave	0.07 SW
Granby Rd	0.90 NE	Wemco Dr	0.50 SW
Granger St	0.67 NE	West St	0.49 NE
Grape St	0.98 NE	Whitin Ave	0.78 NE
Hampden Ave	0.67 SE	Whittier St	0.95 NE
Hampden St	0.62 SE	Wilfred St	0.75 NW
Harry St	0.70 NE	William St	0.76 NW
Hayes Ave	0.39 NW	Willow St	0.66 NW
Hickory St	0.75 NW		
Highland Ave	0.89 SE		

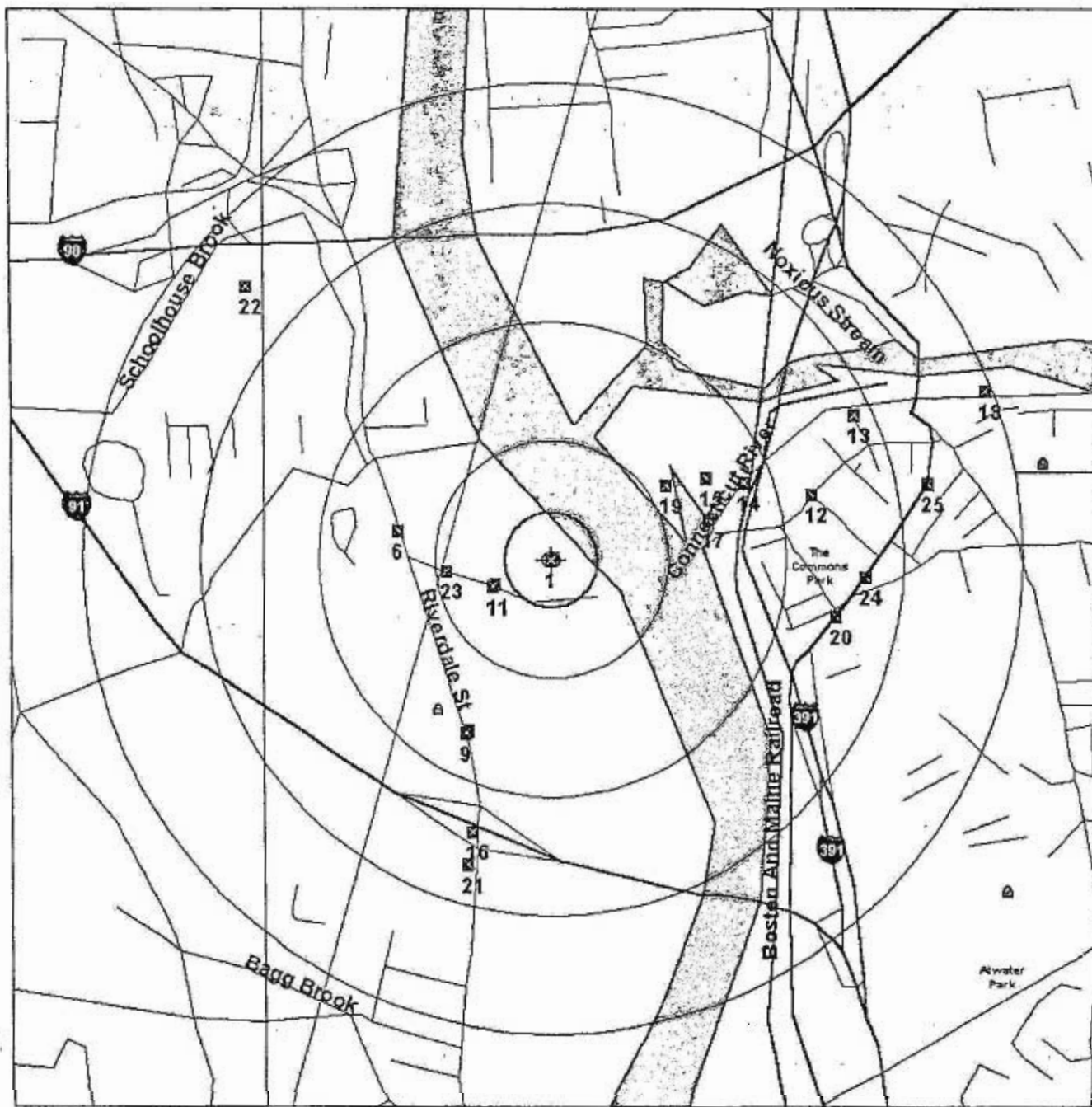
Environmental FirstSearch

1 Mile Radius

ASTM Map: NPL, RCRACOR, STATE Sites



115 WAYSIDE AVE, WEST SPRINGFIELD MA 01089



Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 42.144225 Longitude: -72.622865)

Identified Site, Multiple Sites, Receptor

NPL, Solid Waste Landfill (SWL) or Hazardous Waste

Railroads

Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius



Environmental FirstSearch

.5 Mile Radius

ASTM Map: CERCLIS, RCRATSD, SPILLS90, SWL







115 WAYSIDE AVE, WEST SPRINGFIELD MA 01089



Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 42.144225 Longitude: -72.622865)

Identified Site, Multiple Sites, Receptor   

NPL, Solid Waste Landfill (SWL) or Hazardous Waste 

Railroads

Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

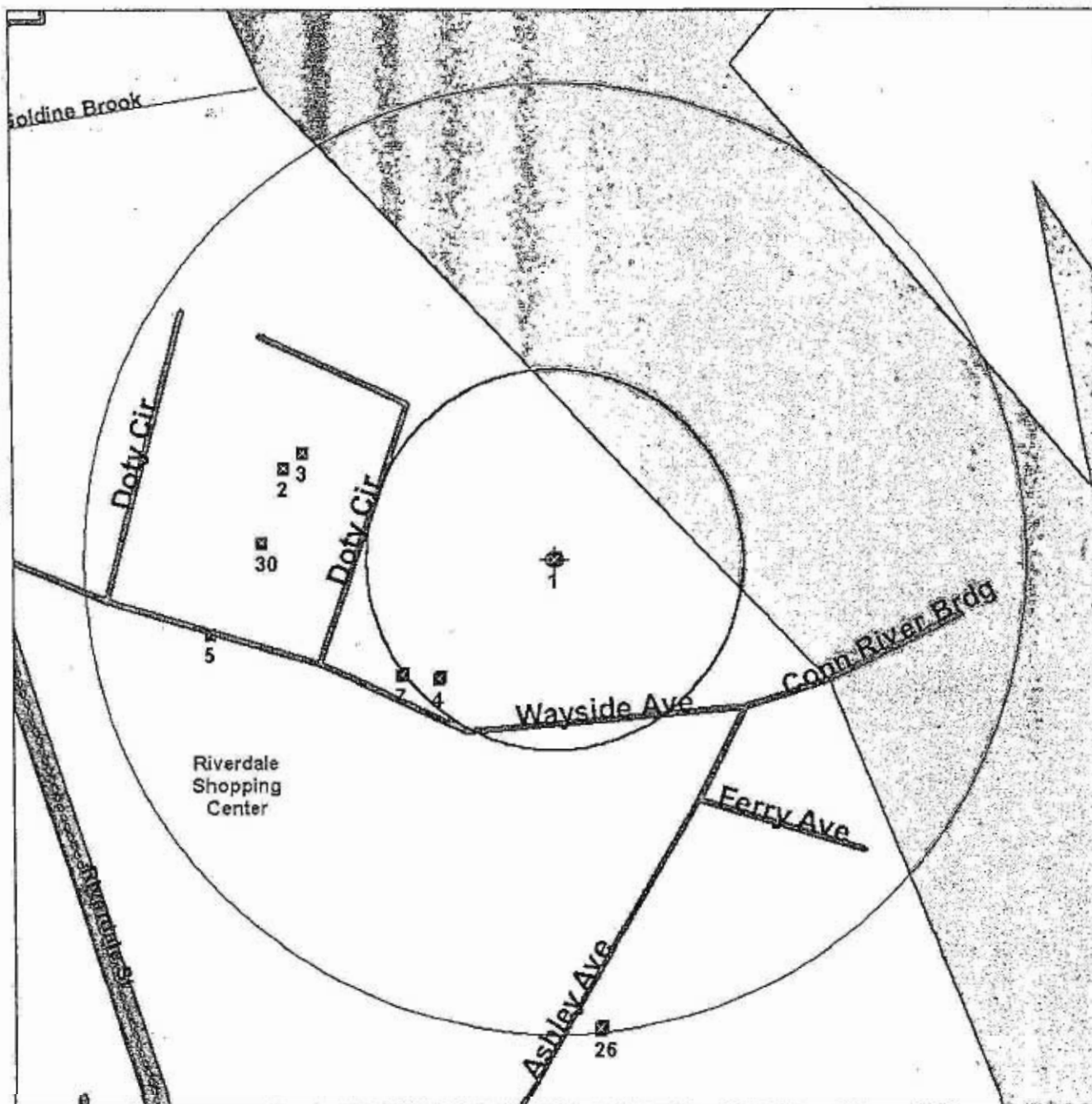
Environmental FirstSearch

.25 Mile Radius

ASTM Map: RCRAGEN, ERNS, UST



115 WAYSIDE AVE, WEST SPRINGFIELD MA 01089



Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 42.144225 Longitude: -72.622865)

Identified Site, Multiple Sites, Receptor

NPL, Solid Waste Landfill (SWL) or Hazardous Waste

Railroads

Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius



ATTACHMENT III

ECS Protocols

GENERAL SAMPLING PROCEDURES FOR AQUEOUS AND SOLID MATRICES

- During field sampling activities, the following applicable procedures will be practiced for sample collection:
- Whenever possible, samples will be collected first from the location expected to be least contaminated. Samples that are expected to be most contaminated will be collected last.
- Accurate and detailed field notes will be maintained in a bound field notebook. Soil samples will be examined and logged in the field.
- Sampling procedures will be performed with the overall intent of collecting representative samples and minimizing sample disturbance.
- Soil samples will be selected for analysis based on the results of qualitative field screening for total volatile organic vapors, visual and olfactory observations, and the depth of the water table.
- Sample containers will be labeled with the site name, project number and date prior to being filled with a sample.
- All sample collection, handling, and shipping information will be recorded in a field notebook.
- Groundwater samples will be logged, using the attached *Groundwater Sampling Log*. Samples of other matrices (sediment, surface water, soil, etc.) will be logged, using the attached *Field Sampling Log*.
- All samples should be collected according the specific requirements of the intended analytical method. Tables 1 and 2 provide lists of sample containers, preservation and holding time requirements for aqueous and soil/sediment samples, respectively.
- All samples will be placed in a chilled, thermally-insulated container containing ice. Blue ice, ice packs, or ice substitutes are not able to reach and maintain the required temperature until receipt at a laboratory.
- All soil samples for volatile organic compound analysis must be collected, preserved, and handled accordingly to SW846 Method 5035. The procedures are outlined in attached memorandum from Spectrum Analytical.
- All samples to be analyzed by Massachusetts Department of Environmental Protection methodologies for Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) will be collected according the published MADEP procedures outlined in the attached memorandum from Spectrum Analytical, Inc.

WELL SAMPLING LOG

Sheet 1 of 1

Weather Conditions:

[illegible]

D = Well diameter in inches.



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Volatile/Semivolatile Analyses						
Ethylene Dibromide (EDB)	504.1	H ₂ O	G (b) Tef Sep	Cool 4° C 75µL Na ₂ S ₂ O ₃ Solution	14 days	40 ml ^{3,4}
GC-Purgeable Halocarbons	601	H ₂ O	G (b) Tef Sep	Cool 4° C HCl to pH < 2 ²	14 days	40 ml ^{3,4}
GC-Purgeable Aromatics	602	H ₂ O	G (b) Tef Sep	Cool 4° C HCl to pH < 2 ^{2,5}	14 days ⁵	40 ml ^{3,4}
GC-Pesticides & PCBs	608	H ₂ O	AG (a) Tef Cap	Cool 4° C NaOH or H ₂ SO ₄ to pH 5-9 ²	7/40 days ⁶	1 L ^{3,4}
HPLC or GC-PAHs	610	H ₂ O	AG (a) Tef Cap	Cool 4° C ²	7/40 days ⁶	1 L ^{3,4}
GC/MS Purgeables	624 524.2	H ₂ O	G (b) Tef Cap	Cool 4° C HCl to pH < 2 ^{2,5}	14 days ⁵	40 ml ^{3,4}
GC/MS Semivolatiles	625	H ₂ O	AG (a) Tef Cap	Cool 4° C	7/40 days ⁶	1 L ^{2,3}
Petroleum Hydrocarbon Analyses						
Oil & Grease	413.1 413.2 1664	H ₂ O	AG (a) Tef Cap	Cool 4° C H ₂ SO ₄ to pH < 2	28 days ⁷	1 L ³
Total Recoverable Petroleum Hydrocarbons by IR	418.1	H ₂ O	AG (a) Tef Cap	Cool 4° C HCl to pH < 2	28 days ⁷	1 L ³
Diesel Range Organics (DRO)	Modified 8015B	H ₂ O	G (b) Tef Cap	Cool 4° C HCl to pH < 2	14/40 days ⁶	1 L ³
Gasoline Range Organics (GRO)	Modified 8015B	H ₂ O	G (b) Tef Sep	Cool 4° C HCl to pH < 2	14 days	40 ml ^{3,4}
Total Petroleum Hydrocarbons by GC	Modified 8100	H ₂ O	G (a) Tef Cap	Cool 4° C HCl to pH < 2	14/40 days ⁶	1 L ³
Total Petroleum Hydrocarbons by GC	Florida Pro	H ₂ O	G (a) Tef Cap	Cool 4° C HCl to pH < 2	14/40 days ⁶	1 L ³
MA DEP EPH	98-1	H ₂ O	See Table 3			
MA DEP VPH	97-12	H ₂ O	See Table 4			
CT DPH ETPH	8015B	H ₂ O	See Table 5			

ENVIRONMENTAL ANALYSES

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Metal Analyses						
AA Metals	200 Series	H ₂ O	P or G (c)	Cool 4° C HNO ₃ to pH<2 ⁸	6 months	250 ml
ICP Metals	200.7	H ₂ O	P or G (c)	Cool 4° C HNO ₃ to pH<2 ⁸	6 months	250 ml
Mercury	245.1	H ₂ O	P or G (c)	Cool 4° C HNO ₃ to pH<2 ⁸	28 days ⁹	250 ml
Chromium VI	218.4	H ₂ O	P or G	Cool 4° C	24 hours	200 ml
Lead, Organic	CA LUFT	H ₂ O	G (a) Tef Cap	Cool 4° C	Analyze immediately	1 L ³
Inorganic/Wet Chemistry Analyses						
Ion Chromatography Anions	300.0	H ₂ O	P or G	Cool 4° C	28 days ¹⁰	500 ml
Acidity	305.1	H ₂ O	P or G	Cool 4° C	14 days	150 ml
Alkalinity	310.1	H ₂ O	P or G	Cool 4° C	14 days	150 ml
BOD	405.1	H ₂ O	P or G	Cool 4° C	48 hours	1 L
Bromide	320.1	H ₂ O	P or G	Cool 4° C	28 days	100 ml
BTU	ASTMD 240	H ₂ O	P or G	Cool 4° C	28 days	50 ml
Carbon Dioxide	SM4500CO ₂ D	H ₂ O	P or G	Cool 4° C	Analyze immediately	100 ml
Chloride	325.1	H ₂ O	P or G	None Required	28 days	150 ml
Chlorine, Total Residual	330.1	H ₂ O	P or G	None Required	Analyze immediately	200 ml
COD	410.4	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	50 ml
Coliform, Fecal	SM 9220	H ₂ O	Sterile Plastic	Cool 4° C ²	6 hours	100 ml
Coliform, Fecal Strep	SM 9230	H ₂ O	Sterile Plastic	Cool 4° C ²	6 hours	100 ml
Coliform, Total	SM 9222	H ₂ O	Sterile Plastic	Cool 4° C ²	30 hours	100 ml
Coliform, Standard Plate Count	SM 907C	H ₂ O	Sterile Plastic	Cool 4° C ²	24 hours	100 ml
Color	110.2	H ₂ O	Sterile Plastic	Cool 4° C	48 hours	200 ml
Conductance, Specific	120.1	H ₂ O	P or G	Cool 4° C	24 hours	100 ml
Cyanide, Amenable	335.1	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Cyanide, Physiologically Available	335.3	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Cyanide, Total	335.4	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Cyanide, Weak Acid Dissociable	SM4500 CN-I	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Flash Point	1010	H ₂ O	P or G	Cool 4° C	ASAP	50 ml
Fluoride	340.2	H ₂ O	P or G	None Required	28 days	200 ml

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Hardness	130.1 130.2	H ₂ O	P or G	Cool 4° C HNO ₃ to pH<2	6 months	100 ml
Iodide	345.1	H ₂ O	P or G	Cool 4° C	24 hours	100 ml
MBAS (Surfactants)	425.1	H ₂ O	P or G	Cool 4° C	48 hours	250 ml
Nitrogen, Ammonia	350.1 350.2	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	400 ml
Nitrogen, Total Kjeldahl	351.1 351.3	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	500 ml
Nitrogen, Nitrate	352.1	H ₂ O	P or G	Cool 4° C	48 hours	250 ml
Nitrogen, Nitrate, plus Nitrite	353.2 353.3	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	100 ml
Nitrogen, Nitrite	354.1	H ₂ O	P or G	Cool 4° C	48 hours	100 ml
Odor	140.1	H ₂ O	G	Cool 4° C	24 hours	500 ml
Orthophosphate	365.2	H ₂ O	P or G	Filter immediately Cool 4° C	48 hours	100 ml
Oxygen, Dissolved	360.1 360.2	H ₂ O	G Bottle and Top	None Required	Analyze immediately	300 ml
pH, Hydrogen ion	150.1 150.2	H ₂ O	P or G	None Required	Analyze immediately	25 ml
Phenolics	420.1	H ₂ O	G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	1 L ³
Phosphorous, Total	365.2	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	500 ml
Phosphorous, Dissolved	365.2	H ₂ O	P or G	Filter immediately Cool 4° C H ₂ SO ₄ to pH<2	24 hours	500 ml
Residue, Filterable (TDS)	160.1	H ₂ O	P or G	Cool 4° C	7 days	300 ml
Residue, Non-filterable (TSS)	160.2	H ₂ O	P or G	Cool 4° C	7 days	300 ml
Residue, Total	160.3	H ₂ O	P or G	Cool 4° C	7 days	300 ml
Residue, Volatile	160.4	H ₂ O	P or G	Cool 4° C	7 days	100 ml
Salinity	S210A	H ₂ O	P or G	Cool 4° C	28 days	100 ml
Silica	200.7	H ₂ O	P	Cool 4° C	28 days	200 ml
Settleable Solids	160.5	H ₂ O	P or G	Cool 4° C	48 hours	1 L
Specific Gravity	ASTM D1298	H ₂ O	P or G	Cool 4° C	28 days	500 ml
Sulfate	375.2	H ₂ O	P or G	Cool 4° C	28 days	300 ml
Sulfide	376.1	H ₂ O	P or G	Cool 4° C pH>9 ¹¹	7 days	500 ml
Sulfite	377.1	H ₂ O	P or G	None Required	Analyze immediately	100 ml
Temperature	170.1	H ₂ O	P or G	None Required	Analyze immediately	1 L

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Total Organic Carbon (TOC)	415.1	H ₂ O	AG (a)	Cool 4° C H ₂ SO ₄ to pH<2	28 days	40 ml
Total Organic Halogens (TOX)	SW 9020B	H ₂ O	AG	Cool 4° C	28 days	200 ml
Turbidity	180.1	H ₂ O	P or G	Cool 4° C	48 hours	100 ml

Notes:

- 1 G (x) = glass; AG (x) = amber glass; P (x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
- 2 For organics and bacteriological analysis, sodium thiosulfate is required for all chlorinated waters. For cyanide, use 0.6g ascorbic acid. Dechlorination must be performed prior to the addition of any necessary preservative.
- 3 Samples must be provided in duplicate to cover for breakage and provide sufficient sample for QC procedures. Extractable organics with matrix spike/matrix spike duplicate QC protocols require a triplicate sample.
- 4 Fill completely to avoid volatile loss.
- 5 Samples with purgeable aromatics must be acidified with HCl to pH<2 in order to have a 14-day holding time.
- 6 Holding time is seven days from sample collection date for extraction, 40 days from extraction date for analysis of the extract. Holding time is fourteen days for extraction if listed as 14/40.
- 7 The EPA has not recommended petroleum hydrocarbon holding times. The holding time given is the laboratory practice by analogy with Oil and Grease standards. State of New Jersey holding time is 7 days. California LUFT is 14 days.
- 8 For the determination of dissolved elements, the sample must be filtered through a 0.45 µm pore diameter membrane filter (prior to acidification) at the time of collection or as soon thereafter as practically possible and acidified immediately thereafter.
- 9 The EPA allows only 14 days holding time for mercury in plastic bottles for drinking water analysis.
- 10 Certain anions require special handling. Holding times and preservation for a particular sample will be determined by the requirement for the anion of interest with the shortest holding time; e.g., nitrate and nitrite - 48 hours; orthophosphate-filter and 48 hours.
- 11 Zinc acetate and NaOH to pH>9.

Table 2
Recommended Containers, Preservation, Storage, & Holding Times
For Soil, Solids, and Wastes

Description	Method	Matrix	Sample Container ¹	Preservative	Prep/Analysis Holding Time	Volume
Volatile/Semivolatile Analyses						
GC-Purgeable	8021B	Soil/Waste	G (b) Tef Sep	See Memo ⁹	14 days	See Memo ⁹
GC/MS- Purgeables	8260C	Soil/Waste	G (b) Tef Sep	See Memo ⁹	14 days	See Memo ⁹
GC-Pesticides & PCBs	8081A/8082	Soil/Waste	AG (a) Tef Cap	Cool 4° C	14/40 days ³	100 g or 8 oz Jar
GC/MS-Semivolatiles – PAHs Base Neutral/Acid Extractable	8270C	Soil/Waste	AG (a) Tef Cap	Cool 4° C	14/40 days ³	100 g or 8 oz Jar
Petroleum Hydrocarbon Analyses						
Oil & Grease	Modified 413.2	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Total Recoverable Petroleum Hydrocarbons	Modified 418.1	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Diesel Range Organics (DRO)	Modified 8015B	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Gasoline Range Organics (GRO)	Modified 8015B	Soil	G (b) Tef Sep	Cool 4° C 15 ml CH ₃ OH	14 days	15 g ²
Total Hydrocarbons by GC	Modified 8100	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Total Hydrocarbons by GC	Florida Pro	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
MA DEP EPH	98-1	Soil	See Table 3			
MA DEP VPH	97-12	Soil	See Table 4			
CT DPH ETPH	8015B	Soil	See Table 5			
Metal Analyses						
Metals-AA	7000 Series	Soil	P or G (c)	Cool 4° C	6 months	100 g or 8 oz Jar
ICP Metals	6010B	Soil	P or G (c)	Cool 4° C	6 months	100 g or 8 oz Jar
Mercury	7471A	Soil	P or G (c)	Cool 4° C	28 days	100 g or 8 oz Jar
Lead, Organic	CA LUFT	Soil	G (a) Tef Cap	Cool 4° C	Analyze immediately	200 g or 8 oz Jar
General Inorganic Analyses						
General Inorganics	9000 Series	Soil	P or G (c) ⁵	Cool 4° C	Not to exceed Table 1 specifications	100 g or 8 oz Jar
Asbestos (Bulk)	EPA Interim Method	Bulk	G (a) Tef Cap	None	Indefinite	50 g minimum

Table 2
Recommended Containers, Preservation, Storage, & Holding Times
For Soil, Solids, and Wastes

Description	Method	Matrix	Sample Container ¹	Preservative	Prep/Analysis Holding Time	Volume
BTU	ASTMD 240 SM 403	Soil	P or G	Cool 4° C	28 days	50 g
Flashpoint/Ignitability	1010	Soil	G (b) Tef Sep or G (a) Tef Cap	Cool 4° C	ASAP	100 g or 8 oz Jar ⁶
pH/Corrosivity	9040B 9045C	Soil/Waste	P or G	Cool 4° C	ASAP ⁷	100 g or 2 oz Jar ²
Reactivity	SW 846 Section 7.3	Soil/Waste	P or G	Cool 4° C	ASAP ⁷	100 g or 8 oz Jar
Standard Plate Count	907C	Soil/Solid/ Waste	Sterile Plastic	Cool 4° C	24 hours	100 g
TCLP/SPLP	1311/1312	Soil/Waste	Inorganics - P or G. (c) or (a) Organics - G (a)	Cool 4° C if appropriate	varies by method	500 g or 32oz Jar ^{2,8}
Total Organic Carbon (TOC)	9060	Soil	G (a) Tef Cap	Cool 4° C	28 days	100g or 8 oz Jar
Total Organic Halogens (TOX)	9020B	Soil	G (a) Tef Cap	Cool 4° C	14 days	100g or 8 oz Jar

Notes:

- 1 G (x) = glass; AG (x) = amber glass; P (x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
- 2 Fill completely to avoid volatile loss; if pre-weighted VOA vials are used, sample cannot exceed half volume of the vial.
- 3 Holding time is fourteen days from sample collection date for extraction, 40 days from extraction date for analysis of extract.
- 4 EPA has not recommended oil and grease, petroleum hydrocarbons or EDB holding times in soil. The holding time is given by analogy to extractable organics.
- 5 Acid washed containers are not appropriate for nitrate and other N analysis. Use glass container ordered with cleaning protocol (1-Chem V220-0250, or equivalent).
- 6 Fill completely to avoid volatile loss. If vials are used, a minimum of 4 is required.
- 7 Holding time is not to exceed 14 days. If sulfide reactivity is sought, then not to exceed 7 days.
- 8 TCLP samples with liquid require more sample volume. For example, a sample with 10% solids requires a minimum of 2000g. Aqueous samples should routinely be provided as 3 liters in order to cover for breakage and provide enough sample for laboratory QC.
- 9 Refer to Spectrum Analytical Memorandum (M-020) dated March 12, 1999.

Table 3
Recommended Containers, Preservation, Storage, & Holding Times
For MA DEP EPH Samples

Matrix	Container	Preservative	Holding Time
Aqueous	1 liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days
Soil/Sediment	4-oz (120 ml) wide mouth amber glass jar with Teflon-lined screw cap	Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days

Table 4
Recommended Containers, Preservation, Storage, & Holding Times
For MA DEP VPH Samples

Matrix	Container	Preservative	Holding Time
Aqueous	2 - 40 ml VOA vials with Teflon-lined screw caps	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	14 days
Soil/Sediment	2 - 40 ml VOA vials with Teflon-lined screw caps	Add 15 g of soil to pre-weighed, laboratory preserved VOA vials on site; additional sample without preservative is needed to figure dry weight calculation; Cool to 4° C	28 days

Table 5
Recommended Containers, Preservation, Storage, & Holding Times
For CT DPH ETPH Samples

Matrix	Container	Preservative	Holding Time
Concentrated Waste Sample	125 ml wide mouth glass container with Teflon lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days
Water Samples with No Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days
Water Samples with Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 ml 10% Na ₂ S ₂ O ₃ solution per gallon. Add 3 to 4 drops of 1:1 HCl; Cool to 4° C*	Samples must be extracted within 7 days and analyzed within 40 days
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon lined lid	Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days

* Dechlorination must be performed prior to the addition of any necessary preservative.



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY**Memorandum**

(M-137)

To: All Spectrum Analytical Clientele

From: Sample Department

Date: January 28, 1998

Subject: Connecticut DEP TPH/GC Method

The following details sample collection, preservation, and handling guidelines for the Connecticut DEP Method, The Analysis of Total Petroleum Hydrocarbons Using Methylene Chloride Extraction and Gas Chromatograph/Flame Ionization Detection as prepared by the Environmental Research Institute of the University of Connecticut, September, 1997.

Recommended Containers, Preservation, Storage, & Holding Times For CT DEP TPH Samples			
Matrix	Container	Preservative	Holding Time
Concentrated Waste Sample	125mL wide-mouth glass container with Teflon lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days
Water Samples with No Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Teflon-lined lids	Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days
Water Samples with Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Teflon-lined lids	Add 3 ml 10% $\text{Na}_2\text{S}_2\text{O}_3$ solution per gallon. Cool to 4°C	Samples must be extracted within 7 days and analyzed within 40 days
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon-lined lid	Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days

ENVIRONMENTAL ANALYSES



SPECTRUM ANALYTICAL, INC.

Memorandum

(M-020)

Important! Please copy and distribute to all Project Managers and Samplers!

To: All Spectrum Analytical Clientele
From: Sample Department
Date: March 12, 1999
Subject: New Sample Collection Techniques for VOC Soils

The following details Spectrum Analytical's policy regarding the collection, preservation, and handling of soil samples submitted for Volatile Organic Compounds (VOCs). These guidelines are in accordance with SW846 Method 5035 for Volatile Organics in Soil and Waste Samples. The Massachusetts Department of Environmental Protection beginning March 15, 1999 will strictly enforce these guidelines. Data for soil samples not properly preserved in accordance with specified guidelines will be rejected by the MA DEP.

The accurate sample collection technique depends on the expected concentration of VOCs in the sample. Techniques are group by three categories of sample types: low VOC concentration, high VOC concentration and oily waste samples.

Low concentration soil samples ($< 200 \mu\text{g/Kg}$ or $< .2 \text{ mg/Kg}$)

1. All samples must be collected in a manner that minimizes sample handling and agitation.
2. Samples must be collected in 20ml VOA vials containing 5ml of sodium bisulfate solution provided by Spectrum Analytical.
3. During collection approximately 5 grams of soil must be added to the pre-measured, pre-weighed sodium bisulfate vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
4. Store samples on ice at 4°C until transport to the laboratory facility.
5. Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.
6. In addition, a third VOA vial (40ml) must be collected for screening, dry weight determination and high concentration analysis (if necessary). This third vial must not contain any sample preservation solution.

High concentration soil samples ($> 200 \mu\text{g/Kg}$ or $> .2 \text{ mg/Kg}$)

1. All samples must be collected in a manner that minimizes sample handling and agitation.
2. Samples must be collected in 40ml VOA vials containing 15ml of purge and trap grade methanol provided by Spectrum Analytical.
3. During collection approximately 10-15 grams of soil must be added to the pre-measured, pre-weighed methanol vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
4. Store samples on ice at 4°C until transport to the laboratory facility.
5. Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.
6. In addition, a third VOA vial (40ml) must be collected for screening and dry weight determination. This third vial must not contain any sample preservation solution.

Oily waste samples

The collection of oily samples depends on knowledge of the waste and its solubility in methanol.

1. If the oily waste is known to be soluble in methanol, collect the sample in accordance with the technique noted for high concentration soils.
2. If the solubility of the oily waste is not known, the sample should either be collected in a vial without a preservative filling the container as full as possible in order to minimize volatile loss in the headspace, or test the solubility of a trial sample in the field. If the trial sample is soluble in methanol, collect the sample in accordance with the technique noted above for high concentration soils. Otherwise, collect an unpreserved sample as described above.

In order to alleviate uncertainties regarding which sample collection technique to use, Spectrum Analytical recommends the collection of all soil samples in accordance with both low and high concentration techniques. Please make certain to submit an additional VOA vial without any sample preservation solution for screening and dry weight determination.

The aforementioned sample containers are immediately available upon request from the laboratory. Be advised to clearly note which preservative is needed when requesting containers, otherwise HCl preserved VOA vials will be provided if no preservative is specified.



SPECTRUM ANALYTICAL, INC.

Memorandum

(M-017)

To: All Spectrum Analytical Clientele

From: Sample Department

Date: March 2, 1999

Subject: Sample Collection, Preservation and Handling

Collection of Samples in Duplicate

The collection of a sample in duplicate is requested when submitting a series of five or more samples per Chain of Custody. Collecting double the volume of a sample will enable us to perform additional quality control procedures in the laboratory. This practice may also be utilized when submitting samples for a project requiring additional quality control information.

Dechlorination of Samples

Clients are urged to carefully follow all preservation guidelines as specified in each applicable method. It has been brought to our attention that government agencies are strictly enforcing these guidelines including sample dechlorination. If residual chlorine is present in a sample, follow the instructions outlined below. Pay close attention to the order in which reagents are added to the sample. A brief synopsis of dechlorinating reagents by method is given for your referenced.

EPA 524.2

Add 25 mg of ascorbic acid to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

EPA 502.2

Add 25 mg of ascorbic acid or 3 mg of sodium thiosulfate to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

EPA 504.1

Add 3 mg of sodium thiosulfate crystals or 75 μ l of sodium thiosulfate solution to sample vials before filling. Seal the vial taking care not to trap any air bubbles. The addition of acid to sample vials is not recommended. Collect samples in duplicate 40ml VOA vials.

EPA 608

If necessary, samples should be adjusted to a pH range of 5.0 to 9.0 with sodium hydroxide or sulfuric acid. If aldrin is to be determined, add sodium thiosulfate when residual chlorine is present. Collect samples in 1 liter glass containers.

EPA 625

If residual chlorine is present, add 80mg of sodium thiosulfate per each liter of water. Collect samples in 1 liter amber glass containers.

The EPA recommends the use of sodium thiosulfate as the dechlorinating reagent in the event that a method allows the use of more than one dechlorinating reagent. One exception to this recommendation is ascorbic acid must be used when vinyl chloride and other gases are measured with a mass spectrometer.

The aforementioned reagents are available from the laboratory. Upon request, VOA vials containing the pre-measured amount of reagent as specified in the method may be supplied. A separate vial containing HCl will be provided for final pH adjustment to <2 when applicable. Be advised to clearly note this requirement when requesting containers, otherwise, HCl preserved VOA vials will be provided.

Cooling of Samples

Samples must be chilled to 4°C immediately following collection and packed with a sufficient amount of ice to maintain that temperature until receipt at laboratory facility. EPA protocols do not allow the use of icepacks or ice substitutes because they are unable to reach a cold enough temperature.

Laboratories are required to maintain a record of sample temperature as received. In the event that no temperature blank is submitted with the sample(s), an observation must be made as to whether the sample(s) is cold or ambient upon receipt. A notation of the observed temperature is made on the duplicate of the Chain of Custody for our records. Samples received on ice will be noted as such. Where upon samples are transferred from a refrigerator, the temperature will be recorded as cold and refrigerated.

Sample Integrity

Spectrum Analytical is committed to maintaining the integrity of all samples submitted for laboratory analyses. Spectrum has a set criterion that all samples must pass in order to be considered to be of satisfactory condition. The Sample Department will notify the client via facsimile of any samples that may be considered to be of unsatisfactory condition. Analysis of unsatisfactory samples will be conducted only with the written authorization from the client.



SPECTRUM ANALYTICAL, INC.

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The following details Spectrum Analytical's policy regarding collection, preservation and handling of all samples that are submitted for VPH and/or EPH analysis. These guidelines are in accordance with Massachusetts DEP Method for the Determination of Volatile (VPH) and Extractable (EPH) Petroleum Hydrocarbons, January 1998.

Sample Collection, Preservation, and Handling for VPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

A Chain of Custody must accompany all samples submitted for analysis, documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 1.

Aqueous Samples

1. Aqueous samples should be collected in duplicate without agitation and without headspace in contaminate-free, HCl preserved, 40ml VOA vial with Teflon-lined septa screw caps. The Teflon liner must come in contact with the sample.
2. The laboratory must determine the pH of all water samples unless the laboratory (this must be noted on the Chain of Custody) supplied the sample vials containing acid for field preservation. The pH measurement may be performed on left over sample. Any sample found to have a pH above 2.0 must be so noted on the laboratory/data report sheet.
3. A reagent trip blank should accompany each batch of water samples.
4. Aqueous samples must be analyzed within 14 days of collection.

Soil Samples

1. Soil samples must be collected in a manner that minimizes sample handling and agitation. Samples must be in a Methanol preserved 40ml VOA vial that is provided by Spectrum Analytical. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.

2. *Methanol preservation of soil samples is mandatory.* Methanol (purge and trap grade) must be added to the sample vial before or immediately after sample collection. Spectrum will provide pre-weighed 40 ml VOA vials containing 15 ml of purge and trap grade Methanol for in-field preservation of VPH samples. In lieu of in-field preservation with methanol, soil samples may be obtained in specially-designed air tight sampling devices, provided that the samples are extruded and preserved in methanol within 48 hours of collection. Additional details and recommendations on soil sampling are provided in Appendix 4.
3. During collection approximately 15 grams (+/- 25%) of soil must be added to exactly 15ml of Methanol. This may be accomplished visually by adding soil until the layer of soil is approximately equal or just less than the layer of preservative. *In all cases, the soil sample in the vial must be completely covered by methanol.*
4. Samples for VPH analysis should be collected in duplicate 40ml vials. An additional sample of the soil should also be obtained (without Methanol) to allow for a determination of soil moisture content and VPH dry weight correction factors (Remaining soil from EPH method will be sufficient to calculate soil moisture content if applicable).
5. A Methanol trip blank should accompany each batch of samples.
6. Observations of vial leakage must be so noted on the laboratory/data report sheet.
7. Soil and sediment samples must be analyzed within 28 days of collection.

TABLE 1
HOLDING TIMES AND PRESERVATIVES
FOR VPH SAMPLES

Matrix	Container	Preservation	Holding Time
Aqueous Samples	2-40-ml VOC Vials w/ Teflon-lined septa screw caps	Add 3 to 4 drops of 1:1 HCl; cool to 4°C	14 days
Soil/Sediment Samples	2 VOC Vials w/ Teflon-lined septa screw caps. 40-ml vials: add 15 g soil	1 ml methanol for every g soil; add before or at time of sampling; cool to 4°C	28 days

Sample Collection, Preservation and Handling for EPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

A Chain of Custody must accompany all samples that are submitted for analysis documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 2.

Aqueous Samples

1. Aqueous samples are collected in HCl preserved 1 liter amber glass bottles with Teflon-lined screw caps.
2. Aqueous samples must be extracted within 14 days of collection, and analyzed within 40 days of extraction.

Soil Samples

1. Soil and sediment samples are collected in 4oz amber glass jars with Teflon-lined screw caps.
2. Soil and sediment samples must be extracted within 7 days of collection, and analyzed within 40 days of extraction.

TABLE 2
HOLDING TIMES AND PRESERVATIVES
FOR EPH SAMPLES

Matrix	Container	Preservation	Holding Time
Aqueous Samples	1-Liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; cool to 4°C	Samples must be extracted within 14 days and extracts analyzed within 40 days
Soil/Sediment Samples	4-oz.(120mL) wide mouth amber glass jar with Teflon-lined screw cap.	Cool to 4°C	Samples must be extracted within 7 days and extracts analyzed with 40 days

APPENDIX 4
Collecting and Preserving VPH Soil Samples
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OPTION 2: Use of a Sealed-Tube Sampling/Storage Device

PERFORMANCE STANDARD: Obtain undisturbed soil sample and immediately seal in air-tight container, for shipment to laboratory and immersion in methanol within 48 hours.

- Step 1: Obtain pre-cleaned and/or disposable samplers/containers that allow the collection and air-tight storage of at least 15 grams of soil.
- Step 2: In the field, obtain an undisturbed sample from a freshly exposed soil. Immediately seal container, and place in a cooler. Obtain a duplicate sample to enable the determination of soil moisture content (this does not need to be in a sealed sampler/container). Transport to analytical laboratory using appropriate chain-of-custody procedures and forms.
- Step 3: Samples must be extruded and immersed in purge and trap (or equivalent) grade methanol at the laboratory within 48 hours of sampling, at a ratio of 1 mL methanol to 1 gram soil. In no case, however, shall the level of soil in the laboratory container exceed the level of methanol (i.e., the soil must be completely immersed in methanol).

NOTE: Documentation MUST be provided/available on the ability of the sampler/container to provide an air-tight seal in a manner that results in no statistically significant loss of volatile hydrocarbons for at least 48 hours. To date, only one commercially available product, the En Core Sampler, has provided this level of demonstration.

OPTION 3: Use of Alternative Collection/Storage/Preservation Techniques

PERFORMANCE STANDARD: Obtain and store an undisturbed soil sample in a manner that ensures the chemical integrity of the sample by (1) preventing the volatilization of petroleum hydrocarbons heavier than C5, and (2) preventing the biological degradation of petroleum hydrocarbons.

NOTE: The onus is on the user of such techniques to demonstrate the validity of the procedures used, via reference to published literature and/or other pertinent data.

SAFETY

Methanol is a toxic and flammable liquid, and must be handled with appropriate care. Use in a well-vented area, and avoid inhaling methanol vapors. The use of protective gloves is recommended when handling or transferring methanol. Vials of methanol should always be stored in a cooler with ice at all times, away from sources of ignition such as extreme heat or open flames.

APPENDIX 4
SHIPPING METHANOL PRESERVED SAMPLES
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Shipping of Hazardous Materials

Methanol is considered a hazardous material by the US Department of Transportation (DOT) and the International Air Transport Association (IATA). Shipments of methanol between the field and the laboratory must conform to the rules established in Title 49 of the Code of Federal Regulations (49 CFR parts 171 to 179), and the most current edition of the IATA Dangerous Goods Regulations. Consult these documents or your shipping company for complete details.

Small Quantity Exemption

The volumes of methanol recommended in the VPH method fall under the small quantity exemption of 49 CFR section 173.4. To qualify for this exemption, all of the following must be met:

- the maximum volume of methanol in each sample container must not exceed 30 mL
- the sample container must not be full of methanol
- the sample container must be securely packed and cushioned in an upright position, and be surrounded by a sorbent material capable of absorbing spills from leaks or breakage of sample containers
- the package weight must not exceed 64 pounds
- the volume of methanol per shipping container must not exceed 500 mL
- the packaging and shipping container must be strong enough to hold up to the intended use
- the package must not be opened or altered while in transit
- the shipper must mark the shipping container in accordance with shipping dangerous goods in acceptable quantities, and provide the statement:

"This package conforms to conditions and limitations specified in 49 CFR 173.4"

Shipping Papers

All shipments must be accompanied by shipping papers which include the following:

Proper Shipping Name:	Methyl Alcohol
Hazardous Class:	Flammable Liquid
Identification Number:	UN1230
Total Quantity:	(mL methanol/container x the number of containers)
Emergency Response Info:	Methanol MSDS attached
Emergency Response Phone:	provide appropriate number
Shipping Exemption:	DOT-E 173.118, Limited Quantity

Labeling & Placarding

Labeling and placarding is not required for valid small quantity exemptions (per 173.118)

SUBSURFACE SOIL SAMPLE COLLECTION USING AN EARTHPROBE™

The following applicable procedures will be performed during collection of soil samples using a 48-inch macro-core sampler:

- Representative subsurface soil samples will be collected in 4-foot intervals by direct push using a clean, decontaminated 48-inch long, 2-inch outside diameter, nickel-plated macro-core sampler containing a dedicated 45-inch long by 1.5-inch inside diameter PETG clear plastic liner. Samples obtained from the macro-core sampler are suitable for physical and chemical analysis.
- Other equipment used during sampling such as mixing bowls and sampling tools will be made of stainless steel.
- The macro-core sampler will be advanced from the surface to a depth of 4 feet. In order to collect samples below four feet, the soil above the sampling interval must be removed. If the borehole remains open samples can be collected continuously to the desired depth.
- Careful visual inspection of the sample will be performed to identify different soil in the top of the sampler that may have been caused by soil sloughing into the open borehole. In this case the judgment of the sampler must be used before completing boring logs or collecting representative soil sample. If the borehole does not stay open or if the sloughing of soils is excessive, the integrity of the soil samples is jeopardized and the 24-inch large bore sampler should be used for sampling below the initial 0- to 4-foot interval.
- Upon retrieval of the macro-core sampler, the following applicable procedures will be followed:
 - The liner will be removed from the sampler and cut open with a pre-decontaminated knife. The soil will be scanned for total volatile organic vapors using a PID or FID and the length of recovery will be measured. This information will be recorded on a boring log. Alternative: A hole will be drilled through the side of the liner, allowing for the collection of a sub-sample using a stainless steel syringe.
 - Soil will be described and logged according to a modified Burmister system. The soil description will be given in the following format: soil name; sorting and plasticity; particle size distribution, shape, and angularity; color; moisture content; density or consistency. This information will be recorded in a field book and on a boring log.
 - Duplicate samples for field screening for total organic vapors will be collected by filling two 8-ounce glass soil jars half full with soil and covering the jar with a double layer of aluminum foil and securing the lid over the foil. One sample will be collected from the top portion of the recovered soil and one from the bottom portion. The sample will be

screened by using a PID or FID according to the Jar Headspace Analytical Screening Procedure found in the Massachusetts Department of Environmental Protection (DEP) Interim Remediation Waste Management Policy for Petroleum Contaminated Soils #WSC-94-400. Alternative: If a sample is collected with a stainless steel syringe, this sub-sample can be placed into a 40-ml VOA vial, filling the vial 1/2 full, and then covering the vial with foil prior to capping with the teflon-lined cap.

- Samples for analysis for volatile organic compounds (VOCs and VPH) will be collected directly from the liner using a decontaminated stainless steel tool. No mixing of the soil sample will occur. The tool will be used to transfer the soil samples into duplicate 40-ml VOA vials containing 15 ml methanol. Approximately 10 to 15 grams of soil must be added to the pre-measured, pre-weighed vials. Loose soil will be removed from the glass threads of the vial to ensure a good seal. A third vial, without preservation solution, will be filled with soil and submitted for dry weight analysis. These vials will immediately be placed in a chilled, thermally insulated container. The container will include a trip blank consisting of methanol in a 40-ml vial.
- Grab samples of soils collected from the sampler for laboratory analysis for semivolatile organic compounds, PCBs, pesticides, TPH, EPH, and inorganics will be composited by homogenized by mixing the soil in a stainless steel bowl or a polyethylene bag, or by the following method, if specified. The soil will be placed on a 1-meter square piece of polyethylene sheeting and rolled backward and forward by lifting and releasing the corners of the sheet. The sample will be spread out on the sheet and divided into quarters. Soil will be collected from each quarter consecutively until the sample containers are full. The container lid will be secured tightly. No chemical preservation is necessary.
- Sample containers will be checked to see that a Teflon liner is present in the cap prior to filling. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- All sample containers will be labeled with the following information: site; project number; earth probe number; sample interval or depth; sample matrix; date; time of collection; testing parameters; grab or composite sample; initials of sampling personnel.
- Sample containers will be capped immediately after filling and cooled to 4°C by placing them into a chilled, thermally insulated container for transport to the laboratory.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination according to the attached procedures.

GROUNDWATER SAMPLE COLLECTION PROCEDURES USING BAILERS OR PUMPS

The following groundwater sampling protocols are based on standard methods found in ASTM Designation: D4448-85a, USEPA guidance documents (numerous references), and Massachusetts DEP "Standard References for Monitoring Wells" (WSC-310-91).

1. MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- health and safety equipment;
- map of well locations;
- well keys;
- interface probe;
- electronic water level indicator;
- PID or FID;
- pH, conductivity, and temperature meters; or a water quality monitoring system (pH, conductivity, temperature, ORP, and optional dissolved oxygen);
- field book;
- disposable gloves;
- stainless-steel, Teflon™ or PVC, bailers with Teflon check valves;
- dedicated polypropylene cord;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- cooler and cold source;
- decontamination equipment;
- polyethylene sheeting;
- polyethylene tubing and check valve;
- field filtering apparatus.

Pre-decontaminated bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site (See Decontamination Procedures).

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

2.0 WELL PURGING

- An interface probe or electronic water level indicator will be lowered to the air-water interface and the depth to water and depth of the well will be recorded. If the presence of a free phase product (light non-aqueous phase liquid - LNAPL) is suspected, an interface probe will be lowered to the product-water interface and the thickness of the product will be measured. Depth of the well will not be measured if LNAPL is present.
- If no free phase product is present in the well purging will begin:
 - Groundwater will be purged from the well using a decontaminated stainless-steel or PVC bottom-emptying bailer equipped with a Teflon™ check valve, or a non-contaminating water pump.
 - Groundwater collected during purging and sampling of groundwater monitoring wells will be discharged to the subsurface at the point of withdrawal in accordance with Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase product) this water will be drummed and disposed of according to applicable municipal, state, and federal regulations (See Disposal Procedures).
 - When using a pump, clean, dedicated polyethylene tubing will be used for each well. In appropriate situations, the polyethylene tubing can be stored in the well casing for use during future sampling events.
 - When using dedicated stainless-steel, PVC, or Teflon™ bailers to purge the wells, a separate pre-decontaminated bailer will be used for each well.
 - The bailer will be suspended with disposable/dedicated polypropylene cord. Care will be taken that the cord does not touch the ground during sampling and purging. The cord will be discarded upon completion of each well sampling event.
 - Non-dedicated bailers will be decontaminated in the field between each well sampling event according to Decontamination Procedures.
 - One of the following procedures will be used to determine if the purging is complete:
 - A. The efficiency of purging will be verified by measuring changes in the temperature, pH, and specific conductance (in-situ parameters) of well water during purging. The stabilization of pH, temperature, and conductivity readings for two consecutive measurements, indicates that "stagnant water" has been removed from the well and that aquifer formation water (groundwater) is now entering the well. Stabilization will be defined as the following; The pH measurements should be to within ± 0.1 pH unit, the

temperature to within $\pm 1.0^{\circ}\text{C}$, and specific conductance to within ± 10 umhos/cm for two consecutive readings.

B. An alternative method for determining if purging is complete may be used where the use of this method meets the assessment objectives. In this case, the well will be pumped or bailed until a specified volume of water has been removed from the well, commonly a minimum of 3 to 5 well bore volumes. In wells screened within low permeability formations, the well may go "dry" prior to the removal of 3 to 5 volumes. Purging is considered complete in this case. However, the complete draining of a well will be avoided if possible during the purging process because of the potential loss of volatiles.

- For complete purging of "stagnant water" (using either a pump or a bailer) the removal of well water will occur from just below the air-water interface in the well. In some situations, when using a pump, the pump intake may be lowered to remain just below the water surface as pumping is in progress. If the well screen is 20 feet or longer, groundwater will be pumped or bailed from the mid-point of the screen.
- The temperature, conductivity, and pH of the first well volume will be recorded using individual pH, conductivity, and temperature meters or a water quality monitoring system. These parameters may be measured following the removal of each subsequent well volume. If specified, oxidation reduction potential will also be recorded.
- The volume of purge water will be measured by pumping or bailing groundwater directly into a container of known volume.
- When using a pump for purging, a water quality monitoring system can be connected to the pump discharge in order to monitor the in-situ parameters. In-situ parameters may be alternatively monitored in a beaker filled from the bailer or the pump discharge.
- When bailing, care will be taken to assure that the bailer cord is held in the hand or placed upon plastic surrounding the well to prevent the potential of cross contamination from the ground surface to the well.
- The volume of water purged from the well, the measurements of temperature, pH, and specific conductivity, and observations of color, odor, and turbidity will be recorded on a sampling log. An example of the ECS Groundwater Sampling Log is attached.
- All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.

- When using dedicated bailers, the stainless-steel bailers will be rinsed with clean potable water following sample collection and placed in a plastic bag for transport to the company's facility where decontamination will take place (See Decontamination Procedures).

3.0 GROUNDWATER SAMPLING PROTOCOL

- Water samples for the analysis of volatile organic compounds (VOCs) (including volatile petroleum hydrocarbons) will be collected as soon as the well has sufficiently recovered from purging and within three hours of purging. Samples for the analysis for VOCs will be collected from the first volume of water collected from the top of the water column in the well.
- Groundwater samples collected for the analysis of VOCs will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2. The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care to not to agitate the sample when transferring it from the bailer to the sample vial. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.
- Groundwater samples for analysis for PCBs, pesticides, total and extractable petroleum hydrocarbons, semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters, will be collected last. Assuming adequate recharge, all samples will be collected within 3 hours of purging or upon 90% recovery.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by using HDPE tubing with a decontaminated checkvalve and an in-line dedicated 0.45 micron filter. Care will be taken to pump the sample with very gentle pressure, in order to avoid any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter HDPE bottle pre-preserved with nitric acid to achieve a pH <2.
- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency

- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the container will be rinsed with deionized water and dried with paper towels. Samples will be cooled to 4°C by placing them immediately in a chilled, thermally insulated container with a cold source;
- All sample containers will be labeled immediately upon collection with the following information: site; project number; well number; date; time of collection; testing parameters; initials of sampling personnel.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.
- All groundwater samples will be immediately placed in a chilled, thermally-insulated container and submitted as soon as possible to a Massachusetts-certified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.

GROUNDWATER SAMPLE COLLECTION PROCEDURES USING LOW FLOW SAMPLING METHODOLOGY

The following groundwater sampling protocols are based on the USEPA low flow purge and sampling procedure (Region 1 Low Flow SOP #: GW 0001) with the following modifications.

1. MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- health and safety equipment;
- map of well locations;
- well keys;
- interface probe;
- electronic water level indicator;
- PID or FID;
- a multiprobe water quality monitoring system (pH, specific conductivity, temperature, ORP, and optional dissolved oxygen)-i.e. Geotech Multiprobe Sampling System™ or YSI Model 3560 Water Quality Monitoring System™
- field book;
- adjustable rate peristaltic pump;
- 3/16-inch inside diameter and 1/4-inch outside diameter polyethylene tubing;
- 1/4-inch inside diameter silicone tubing;
- cable ties;
- folding table;
- disposable gloves;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- cooler and ice;
- decontamination equipment;
- polyethylene sheeting;
- field filtering apparatus.

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

2.0 WELL PURGING

- An interface probe or electronic water level indicator will be lowered to the air-water interface and the depth to water and depth of the well will be recorded. If the presence of a free phase product (light non-aqueous phase liquid - LNAPL) is suspected, an interface probe will be lowered to the product-water interface and the thickness of the product will be measured. Depth of the well will not be measured if LNAPL is present and the well will not be sampled using the low flow sampling procedure.
- If no free phase product is present in the well purging will begin.
 - Purging of each well prior to sampling is conducted using an adjustable rate peristaltic pump in line with a multiprobe water quality monitoring system. This instrument allows for the visual monitoring of five parameters (temperature, pH, specific conductivity, dissolved oxygen and Eh -- oxidation-reduction potential) simultaneously in real time. This system uses an adjustable rate peristaltic pump system to collect the purge water directly into a flow-through chamber assembly containing the parameter probes.
 - A dedicated polyethylene tubing of 3/16-inch inside diameter and 1/4-inch outside diameter is tied flush with the tip of a water-level measurement indicator using a plastic cable tie and is lowered into the well casing until it is in the center of the water column.
 - A dedicated section, approximately one foot long, of 1/4-inch inside diameter silicone tubing is fit through the peristaltic pump. The silicone tubing connects the dedicated polyethylene tubing from the well to a small piece of polyethylene tubing (approximately 24-inch), which attaches to the flow-through chamber of the multiprobe water quality monitoring system.
 - The pump is started at its highest speed setting until the purge water is directly discharged into the chamber. Once the chamber is filled with purge water, the multiprobe meter displays are turned on displaying the initial stabilization parameter measurements. The volume of purge water will be measured by pumping groundwater directly into a container of known volume.
 - The pumping rate is slowed once the chamber is filled with purge water to a rate of approximately 0.1 gallons per minute or as appropriate such that drawdown of the water level does not exceed 0.3 feet. The water level inside the well casing is monitored every three to five minutes or approximately every 0.5 gallons during purging to ensure drawdown does not exceed 0.3 feet.

- Parameters are recorded and logged every 0.5-gallon until the amount of water purged approaches the minimum purge amount of three times the well volume. After purging the minimum amount of water from the well, the parameters are recorded and logged every 0.25-gallon until stabilization occurs. Field measurement data is recorded for each well during the purging process in a field notebook.
- The volume of water purged from the well, field measurement data (temperature, pH, specific conductance, dissolved oxygen and Eh) along with observations of color, odor and turbidity are recorded for each well during the purging process in a field notebook or sampling log. An example of the ECS Low Flow Groundwater Sampling Log is attached.
- Purging is performed until the following requirements have been met:
 - A. A minimum of three well volumes are extracted from the well without exceeding a drawdown on 0.3 feet.
 - B. The measured field parameters stabilize within ± 0.1 pH units, ± 1.0 degrees Celsius and within ± 10 μ mhos/cm for specific conductance.
 - C. Stabilization of pH, temperature and specific conductivity occurred for three or more consecutive measurements during three to five minute intervals.
- All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.
- Groundwater collected during purging and sampling of groundwater monitoring wells will be discharged to the subsurface at the point of withdrawal in accordance with Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase product) this water will be drummed and disposed of according to applicable municipal, state, and federal regulations (See *Disposal Procedures*).

3.0 GROUNDWATER SAMPLING PROTOCOL USING PERISTALTIC PUMP

- Once stabilization of the groundwater parameters occurs, the sampling of the groundwater from the well begins. Groundwater sampling may be performed with bailers according to ECS SOP 8.10 or using the peristaltic pump and dedicated polyethylene tubing. The following SOP describes groundwater sampling using the peristaltic pump, the dedicated section of silicon tubing, and the dedicated section of polyethylene tubing in the well.
- Immediately prior to sampling, the polyethylene tube leading to the flow-through chamber of the multiprobe water quality monitoring system is disconnected so that the groundwater flows directly from the 1/4-inch silicone tubing into the sample vials.
- The location of the sampling point (or position of the end of the dedicated in-well tubing) will generally be the middle of the screened interval. Knowledge of specific layers of contamination may change this sampling point.
- Water samples for the analysis of volatile organic compounds (VOCs) and volatile petroleum hydrocarbons (VPH) will be collected first from the tubing in the water column in the well.
- Groundwater samples collected for the analysis of VOCs and will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2. The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care not to agitate the sample which may mean slowing down the rate of the peristaltic pump. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.
- Groundwater samples for analysis for PCBs, pesticides, total petroleum hydrocarbons, extractable petroleum hydrocarbons (EPH), semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters, will be collected last but immediately after collecting groundwater samples for analysis of VOCs.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by connecting a dedicated 0.45 micron filter in-line to the 1/4-inch silicone tubing. Care will be taken to adjust the pumping rate, in order to avoid any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter HDPE bottle pre-preserved with nitric acid to achieve a pH <2.
- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should

be referenced for selection of proper sample containers and preservation methods for each analytical method.

- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency
- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the container will be rinsed with deionized water and dried with paper towels. All sample containers will be labeled immediately upon collection with the following information: site; project number; well number; date; time of collection; testing parameters; initials of sampling personnel.
- All groundwater samples will be cooled to 4°C by placing them immediately in a chilled, thermally insulated container with ice and submitted as soon as possible to a Massachusetts-certified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.

WATER-LEVEL MEASUREMENT PROCEDURES

Depth to water-level measurements are taken to determine the elevation of the potentiometric surface. Water level measurements will be performed in each monitoring well prior to sampling. Because of fluctuating groundwater levels, all wells will be measured prior to sampling and within the same day, if possible. If the presence of NAPL is suspected, measurements will be made with an oil/water interface probe, otherwise, an electronic water level indicator will be used. These instruments are accurate to 0.01 feet. The following procedures are based on Massachusetts DEP guidelines (DEP, 1991) and ASTM Designations D 5092 - 90 and D 4750 - 87.

- The measuring instrument will be decontaminated prior to use and between wells according to the standard decontamination procedures.
- Measurements will progress from the least contaminated wells to the most contaminated wells.
- The well casing will be opened and the headspace will be monitored for total organic vapors using a PID or FID. If a reading of 5 ppm or greater is detected, the well will be allowed to vent for 5 to 10 minutes. If after this time the reading is 5 ppm or greater, a determination regarding the level of personal protective equipment needed will be made before sampling continues. If specified, PID or FID readings for well casing headspace will be recorded for each well.
- An interface probe will be lowered to the air-water interface and the depth to water will be recorded. The interface probe will be lowered to the bottom of the well to measure the depth of the well and in wells where chlorinated hydrocarbons were detected to determine if dense non-aqueous phase liquid (DNAPL) is present. If the presence of a free phase product (LNAPL) is indicated, the probe will be lowered to the product-water interface and the thickness of the product will be recorded but the depth of the well will not be measured.
- One water-level measurement will be made from a reference point on the PVC well riser pipe and another from the top of the protective well casing at the surface elevation. The reference point on the PVC will be a V-notch cut into the top edge of the riser pipe at the highest point. This will be the surveyed point on the riser. The reference point on the well riser is preferred for determining depth to water-level due to its stability. The protective well casing is more susceptible to movement through settling, frost heaving, or displacement by impact.

- The volume of standing water in the well (static volume) will be calculated and used during well purging prior to sampling.
- The total depth of the well, depth to product, depth to water, standing water height, and static volume will be recorded on the groundwater sampling log (attached).

DECONTAMINATION

Decontamination will be performed in order to: minimize the spread of contaminants on the Site and from one sampling location to another; reduce the potential exposure of field personnel to contaminants; and to ensure good data quality and reliability. Decontamination of all field analytical testing and sampling equipment will be performed according to the following procedures. These procedures are based on ASTM Designation D 5088-90, USEPA CERCLA QAPP Review Guidance, 1987, and Massachusetts DEP Standard Reference for Monitoring Wells, 1991.

Equipment cleaning procedures include pre-field, field, and post-field decontamination. Non-disposable equipment will be decontaminated after completing each sampling event. In cases of gross contamination (free phase product), rinse water will be contained for proper disposal according to municipal, state, and federal regulations. Decontamination procedures will be monitored through sampling and analysis when quality assurance/quality control checks are necessary.

Equipment will be dedicated to each sampling point and decontamination will be performed at the off-site facility as much as possible.

Decontaminated equipment will be rested on polyethylene sheeting at each sampling point.

Samplers will use new disposable gloves at each sampling point.

Potable water from the public water supply will be used for control rinse water.

A certified laboratory supply of deionized water will be used for decontamination of field testing and sampling equipment and for the collection of rinsate blanks. Deionized water will be stored in Nalgene, glass, or Teflon containers. The storage area containing the deionized water will be separated from the storage area for solvents.

Equipment rinsate blanks will be collected when a quality control check of the decontamination procedure is necessary. This check will not be performed if dedicated equipment is used. One blank will be collected at least once during a sampling event for each different piece of sampling equipment used. Rinsate blanks will be prepared by pouring deionized water over the decontaminated piece of equipment and collecting it in the sample container. The equipment rinsate blank will be analyzed for the same analytes as the samples that have been collected with that piece of equipment.

1.0 MATERIALS

- health and safety equipment;
- laboratory-supplied deionized water;
- phosphate-free detergent (Alconox, Liquinox);
- potable water (municipal water source);
- methanol;
- Hexane;
- Acetone;
- nitric acid rinse solution;
- wash basins;
- inert brushes;
- polyethylene sheeting;
- large heavy duty garbage bags;
- spray bottles;
- zip-lock bags;
- paper towels/Handiwipes;
- disposable gloves.

2.0 DECONTAMINATION PROCEDURES

- Stainless steel bailers will be disassembled, soaked in hot potable water and scrubbed with a brush in "Alconox" detergent and potable water, and rinsed with clean potable water at the company's facility. Bailers will be allowed to air dry in a vertical position in a contaminant-free environment.
- Prior to the sampling event, bailers used for the collection of samples which will undergo analysis for total petroleum hydrocarbons and volatile organic compounds will be rinsed with hot potable water followed by a 10% methanol solution of pesticide grade methanol and deionized water, followed by a final rinse with deionized water. The volume of deionized water will be at least five times the volume of the methanol. Bailers used for the collection of samples which will undergo analysis for semi-volatile organic compounds, PCBs, and pesticides will be rinsed with a technical grade acetone followed by a pesticide grade hexane, and a final deionized water rinse as above. Bailers used for the collection of groundwater samples which will undergo analysis for metals will be rinsed with 10 per cent nitric acid solution prepared from reagent grade nitric acid and deionized water followed by a potable water rinse, and a final deionized water rinse.
- Bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site.

- Following sample collection, the stainless-steel bailers will be rinsed with clean potable water and placed in a plastic bag for transport to the company's facility where decontamination will take place.
- Soil and sediment sampling equipment (stainless steel sampling scoop, tool, and bowl, split-spoon and macro-core sampler, knife) will be decontaminated in the field after each use.
- Soil and sediment sampling equipment will be decontaminated as follows: scrubbed with inert brushes in a bucket containing phosphate-free detergent and potable water; rinsed with potable water; rinsed with pesticide grade methanol; and finally rinsed with deionized water. The final potable water and deionized water rinse volumes will equal 5 times the volume of the methanol rinse. The equipment will be allowed to air dry and will be stored in a clean environment until reused.
- Non-dedicated field equipment used for the collection of samples to be analyzed for metals and filtering apparatus will be cleaned prior to each use by using a phosphate-free detergent solution, a potable water rinse, followed by a 10 percent nitric acid rinse solution prepared from reagent grade nitric acid and deionized water, a potable water rinse, and a final rinse with deionized water. Used filters will be properly disposed of.
- The YSI Water Quality Monitoring System™, Geotech Multi Parameter™ meter, interface probe, down-hole slug test equipment, QED Water Wizard well development equipment, and other measuring instruments will be decontaminated between uses by rinsing with Alconox or Liquinox, followed by potable water and deionized water rinses. A methanol rinse will be utilized prior to the deionized water rinse in the event of gross contamination such as contact with free-phase product.
- The drill rig and earthprobe and all drilling equipment and associated tools, including but not limited to augers, drill casing, drill rods, sampling equipment, and wrenches, will be steam cleaned prior to beginning the drilling on the Site. This cleaning will consist of using a high pressure detergent steam cleaning equipment, followed by a nanograde methanol swabbing if gross contamination was present. This will be followed by a controlled water rinse. Any down-hole equipment (auger flights, rods, sampling equipment, etc.) coming in contact with gross contamination (i.e. free phase product) will be steam-cleaned between uses. Otherwise equipment will be scrubbed manually with potable water and Alconox as needed to remove soil between uses.
- Sampling equipment and probes will be decontaminated in an area covered by polyethylene sheeting adjacent to the sampling location.
- In cases of gross contamination (i.e. free phase product) rinse water will be collected for proper disposal according to municipal, state or federal regulations. Contaminated solids (disposable gloves, clothing, polyethylene tubing and sheeting, etc.) will be collected and characterized for proper disposal.

- Decontamination procedures will be fully documented in the field notebook. The following information should be recorded: Site location, date, time and weather; sample location where equipment used; location where decontamination was performed; field personnel performing the decontamination; decontamination procedures; disposal of rinse water if necessary; samples collected for QA/QC and analytical results.
- Health and safety procedures associated with decontamination are found in the Health and Safety Plan.

SAMPLE CUSTODY PROCEDURES

- Sample custody procedures will be followed in order to create an accurate written record. This record can be used to trace the possession and handling of all samples from collection, through all transfers of custody until the samples are delivered to the analytical laboratory. Custody for samples will be maintained by field personnel collecting the samples. The following procedures are based on ASTM Designation D 4840-88, standard methods found in DEP (1991), and USPEA (1987) guidance documents.
- A self-adhesive waterproof sample label will be affixed to each sample container before sample collection. A waterproof pen will be used to record the following information on the label:

Project Number
Sample ID Number
Sample Location
Sample Matrix
Date and Time of Sample Collection
Designation as Grab or Composite Sample
Parameters to be Tested
Preservative
Initials of Sampler

- All sample containers will be supplied by a state-certified laboratory. Commercially purchased sample containers will be pre-cleaned and quality controlled according to EPA recommended washing procedures and specifications (Level I and/or Level A according to the vendor's specifications). Custody of the sample containers will be maintained by the Project Manager and will be relinquished to the field personnel collecting the samples after verification that the proper containers have been assigned for the proper sampling task.
- Chemical preservatives will be added to the sample containers by the state-certified laboratory providing the containers. Tables 1 and 2 indicate the type of preservation which will be used.
- Chain-of-custody records will be filled out by the sampler using information from the sample labels. The chain-of-custody will include the dates and times of collection and receipt. The chain-of-custody will document any tampering that may have occurred; if there are no such comments then no tampering was observed. An example of the chain of custody (provided by Spectrum Analytical, Inc. of Agawam, Massachusetts) is included.

- One chain-of-custody record will be used for each packaged lot of samples. More than one chain-of-custody may be used for one packaged lot.
- Samples will be stored in a thermally insulated container with ice. EPA protocols do not allow the use of ice packs or ice substitutes because they are unable to reach or maintain a cold enough temperature. The samples will be delivered to a state-certified laboratory by a member of the sampling team within 24 hours of sample collection. The field chain-of-custody records completed at the time of sample collection will be placed inside the cooler for transport to the laboratory. These forms will be sealed in a zip-lock type plastic bag to protect them against moisture. Each cooler will contain sufficient ice to insure that a 4°C temperature is maintained, and will be packed in a manner to prevent damage to the sample containers.
- The chain-of-custody form will be signed by the relinquishing party and the receiving party. The reason for transfer will be indicated each time the sample custody changes. Internal laboratory records will document sample custody until its final disposition.

ATTACHMENT IV

Soil Boring Logs



BORING NO.	EP-1		
DOCUMENT NO.			
SHEET	1	OF	1
LOCATION			

BORING COMPANY	Environmental Compliance Services, Inc.	JOB NUMBER:	13997.00
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, Massachusetts	PROJECT NAME	
FOREMAN:	Nicholas Cardinali	PROJECT ADDRESS	115 Wayside Avenue, W. Spfd
ECS INSPECTOR:	Karl Dietzler	CLIENT NAME	Trailerworks, Inc.

See Site Plan

GROUNDWATER OBSERVATIONS			CASING	SAMPLER	CORE BARREL	
Date:	Depth:	Stabilization Time	N/A	4' Macro	N/A	Casing Elevation (B.V.)
		INSIDE DIAMETER :	1.125"			PVC Elevation (B.V.)
		HAMMER WEIGHT :				Surface Elevation (B.V.)
		HAMMER FALL :				Date Started : 7/25/00
		NOTES :	Earth Probe			Date Completed : 7/25/00

[illegible]

1. Field testing values represent total organic vapors- TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hnu Model PID-Photoionization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.

2. Groundwater encountered at approximately 14.5 feet below grade.



SOIL BORING and MONITORING WELL INSTALLATION LOG

SHEET	1	OF	1
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LOCATION

See Site Plan

BORING COMPAN	Environmental Compliance Services, Inc.
BORING COMPANY	558 Silver Street, Agawam, Massachusetts
FOREMAN	Nicholas Cardinali
ECS INSPECTOR	Karl Dietzler

JOB NUMBER:	13997.00
PROJECT NAME:	
PROJECT ADDRESS:	115 Wayside Avenue, W. Spfld
CLIENT NAME:	Trailerworks, Inc.

GROUNDWATER OBSERVATIONS			CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE	N/A	N/A
			INSIDE DIAMETER	1.125"	
			HAMMER WEIGHT		
			HAMMER FALL		
			NOTES	Earth Probe	

Casing Elevation (ft.)	
PVC Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	7/25/00
Date Completed	7/25/00

[illegible]

1. Field testing values represent total organic vapors- TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hnu Model PID Photoionization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm, BDL = Below Detection Limits.

2. Groundwater encountered at approximately 14 feet below grade.



BORING NO. 117	EP-3		
DOCUMENT NO. 117			
SHEET 1	1	OF	1

LOCATION

See Site Plan

Casing Elevation (ft.)	
PVC Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	7/25/00
Date Completed	7/25/00

Well As Built	Field Testing	Notes
---------------	---------------	-------

		0.2	1
		BDL	
		3	
		3.4	
		1.4	
		5.4	
		5	
		1.4	2

[illegible]

1. Field testing values represent total organic vapors- TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hru Model PID Photoionization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.

2. Groundwater encountered at approximately 14 feet below grade.



SOIL BORING and MONITORING WELL INSTALLATION LOG

BORING NO.	EP-4		
DOCUMENT NO.			
SHEET	1	OF	1

LOCATION

See Site Plan

1. Field testing values represent total organic vapors - TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hnu Model PID - Photionization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.



SOIL BORING and MONITORING WELL INSTALLATION LOG

BORING NO.	EP-6		
DOCUMENT NO.			
SHEET	1	OF	1

LOCATION

See Site Plan

BORING COMPANY	Environmental Compliance Services, Inc.	JOB NUMBER	13997.00
BORING COMPANY ADDRESS	566 Silver Street, Agawam, Massachusetts	PROJECT NAME	
FOREMAN	Nicholas Cardinali	PROJECT ADDRESS	115 Wayside Avenue, W. Spfd
ECS INSPECTOR	Karl Dietzler	CLIENT NAME	Trailerworks, Inc.

GROUNDWATER OBSERVATIONS

GROUNDWATER OBSERVATIONS			CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE	N/A	4" Macro
			INSIDE DIAMETER	1.125"	
			HAMMER WEIGHT		
			HAMMER FALL		
			NOTES:	Earth Probe	

Casing Elevation (ft.)	
PVC Elevation (ft.)	
Surface Elevation (ft.)	
Dune Started:	7/28/00
Dune Completed:	7/28/00

[illegible]

1. Field testing values represent total organic vapors- TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hnu Model PID - Photoionization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.

2. Groundwater encountered at approximately 11 feet below grade.

SOIL BORING and MONITORING WELL
INSTALLATION LOG

BOOK NO.:	EP-8		
DOCUMENT NO.:			
SHEET	1	OF	1

LOCATION

See Site Plan

1. Field testing values represent total organic vapors - TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hnu Model PID - Photoionization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.

ATTACHMENT V

Groundwater Sampling Log



Environmental Compliance Services, Inc.
588 Silver Street, Agawam, Massachusetts 01001
MA: (413) 789-3530 FAX: (413) 789-2776

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: _____
Location: 115 W. W. Spina
Personnel: _____

Job Number: _____
Date: 7/24/01
Weather Conditions: Partly Cloudy - humid

WELL I.D.
Mud #1

	Sample Time (minutes)	TEMP. Degrees (Celsius)	pH	Specific Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	mV millivolts	Drawdown <0.3 feet	Depth to Water PVC/RIM	Depth of Well PVC/RIM	Standing Water (feet)	Moisture of Saturated Zone (feet)	Static Volume (gallons)	Minimum Purge Volume (gallons)	Observations
2	Inch Dia. Casing							15.90	26.80	10.90	5.90		5 gal	
	2.0	16.7	7.59	771	0.74	-73								
	4.0	15.6	7.29	658	1.67	-74								
	6.0	15.4	6.82	634	2.17	-74								
	8.0	15.4	6.46	633	2.04	-74								
	10.0	15.2	6.29	630	2.07	-74								
	12.0	15.2	6.21	630	2.44	-74								
	14.0	15.1	6.18	633	2.57	-73								
	16.0	15.1	6.17	632	2.59	-73								
	18.0	15.1	6.16	632	2.62	-73								
	20.0	15.1	6.16	632	2.62	-73								
	22.0	15.1	6.16	632	2.62	-73								
	24.0	15.1	6.16	632	2.62	-73								

Notes/Calculations:

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: _____
Location: 115 W. 4th St. NW, S.W. 4th St.
Personnel: RMP

Job Number:

Date:

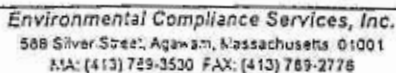
Weather Conditions:

WELL I.D.

MW-2

Sample Time (minutes)	TEMP. Degrees (Celsius)	pH	Specific Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	mV millivolts	Drawdown <0.3 feet	Depth to Water PVC/RIM	Depth of Well PVC/RIM	Standing Water (feet)	Aricle of Saturated Zone (feet)	Static Volume (gallons)	Minimum Purge Volume (gallons)	Observations
2	Inch Dia. Casing						16.0	25.95	9.95			5	
2.0	16.0	7.04	271	5.71	-46								
4.0	15.6	7.06	255	6.78	-46								
6.0	15.5	6.98	226	7.03	-46								
8.0	15.4	6.82	225	7.24	-46								
10.0	15.1	6.53	223	7.26	-46								
12.0	15.0	6.35	220	7.26	-46								
14.0	14.8	6.03	215	7.23	-46								
16.0	14.7	5.98	214	7.32	-46								
18.0	14.8	6.09	214	7.15	-45								
20.0	14.6	5.85	211	7.21	-45								
22.0	14.6	5.79	211	7.15	-45								
24.0	14.6	5.79	211	7.15	-45								
26.0	14.6	5.78	213	7.17	-45								
28.0	14.6	5.78	213	7.17	-45								
30.0	14.6	5.77	213	7.16	-45								

Notes/Calculations:



Client: _____	Job Number: _____	WELL I.D. _____
Location: <u>115 Wayside Ave / W. SpRd</u>	Date: <u>7/24/00</u>	<u>MW-3</u>
Personnel: <u>KMD</u>	Weather Conditions: <u>Cloudy / Humid 80's</u>	

Notes/Calculations:

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: _____
Location: 115 Wayside Ave / W. 50th
Personnel: KMD

Job Number: 12142
Date: 7/24/02
Weather Conditions: cloudy / humid

WELL I.D.
MW - 4

[illegible]

Notes/Calculations:

ATTACHMENT VI

Laboratory Analytical Results



SPECTRUM ANALYTICAL, INC.

Featuring

HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138

Rhode Island # 98 Maine # MA138

Florida # E87600 / 87562

New Hampshire # 2538

Connecticut # PH-0777

New York # 11393

ECS, Inc.

588 Silver Street

Agawam, MA 01001

8/4/00

Attn: Mark A. Haynes

Client Project Number: 13997

Location: 115 Wayside Ave-W. Spfld, MA

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AB99089	EP-9 12-14'	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes % Solids
AB99090	EP-2 6-8'	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes % Solids
AB99091	Ep-4 2-4'	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes % Solids



SPECTRUM ANALYTICAL, INC.

Featuring

HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: 115 Wayside Ave-W. Spfld, MA

Laboratory ID

Client Sample ID

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method including any data obtained from a subcontract laboratory.

Authorized by:

Hanibal C. Tayeh

President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: 115 Wayside Ave-W. Spfld, MA
 Client: ECS
 Lab ID No: AB99089
 Client Id: EP-9 12-14'

Client Project No: 13997
 Submittal Date: 7/28/00
 Collection Date: 7/28/00
 Matrix: Soil

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
VOC Preparation							
VOC Extraction (solid)	Field ext			7/28/00	7/28/00		SW846 5035
Volatile Organic Compounds							
<i>VPH Aliphatics/Aromatics</i>							
C5-C8 Aliphatic Hydrocarbons	36	mg/Kg	10.7	8/3/00	8/3/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	39	mg/Kg	3.58	8/3/00	8/3/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	100	mg/Kg	3.58	8/3/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	56	mg/Kg	10.7	8/3/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	139	mg/Kg	3.58	8/3/00	8/3/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1,000	mg/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
VPH Target Analytes							
Benzene	Not detected	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-12
Ethylbenzene	3,800	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-12
m,p-Xylenes	10,600	ug/Kg	1400	8/3/00	8/3/00	RLJ	MA VPH 97-12
o-Xylene	5,400	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-12
Naphthalene	7,600	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	84	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	76	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1,000	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
TPH Preparation							
Ultrasonic Extraction	Completed			8/3/00	8/3/00	RT	SW846 3550B
Petroleum Hydrocarbon Analysis							
<i>EPH Aliphatics/Aromatics</i>							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
EPH Target PAH Analytes							
Naphthalene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB99089

Collection Date: 7/28/00

Client Id: EP-9 12-14'

Matrix: Soil

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Acenaphthene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	81	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	56	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	93	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	94	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
% Solids	91.2	%		8/3/00	8/3/00	RT	SM2540 B Mod

Lab ID No: AB99090

Client Id: EP-2 6-8'

Collection Date: 7/25/00

Matrix: Soil

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
VOC Preparation							
VOC Extraction (solid)	Field ext			7/25/00	7/25/00		SW846 5035
Volatile Organic Compounds							
<i>TPH Aliphatics/Aromatics</i>							
C5-C8 Aliphatic Hydrocarbons	108	mg/Kg	12.0	8/3/00	8/3/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	386	mg/Kg	4.01	8/3/00	8/3/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	520	mg/Kg	4.01	8/3/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	184	mg/Kg	12.0	8/3/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	906	mg/Kg	4.01	8/3/00	8/3/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1,000	mg/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
VPH Target Analytes							
Benzene	Not detected	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Ethylbenzene	14,400	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
m,p-Xylenes	41,600	ug/Kg	1600	8/3/00	8/3/00	RLJ	MA VPH 97-12
o-Xylene	20,000	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Naphthalene	48,000	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	74	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	81	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1,000	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
TPH Preparation							
Ultrasonic Extraction	Completed			8/1/00	8/1/00	DD	SW846 3550B
Petroleum Hydrocarbon Analysis							
<i>EPH Aliphatics/Aromatics</i>							
C9-C18 Aliphatic Hydrocarbons	1,300	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	250	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	1,299	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	1,367	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
EPH Target PAH Analytes							
Naphthalene	27,000	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	37,000	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	380	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	370	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	800	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	2,000	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB99090

Collection Date: 7/25/00

Client Id: EP-2 6-8'

Matrix: Soil

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (a) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	84	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	96	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	97	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	103	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
% Solids	85.1	%		8/1/00	8/1/00	DD	SM2540 B Mod

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
VOC Preparation							
VOC Extraction (solid)	Field ext			7/25/00	7/25/00		SW846 5035
Volatile Organic Compounds							
<i>VPH Aliphatics/Aromatics</i>							
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/Kg	3.39	8/3/00	8/3/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	26	mg/Kg	1.13	8/3/00	8/3/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	39	mg/Kg	1.13	8/3/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/Kg	3.39	8/3/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	65	mg/Kg	1.13	8/3/00	8/3/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	250	mg/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
<i>VPH Target Analytes</i>							
Benzene	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-12
Ethylbenzene	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-12
m,p-Xylenes	Not detected	ug/Kg	450	8/3/00	8/3/00	RLJ	MA VPH 97-12
o-Xylene	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-12
Naphthalene	4,900	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	78	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	88	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	250	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
TPH Preparation							
Ultrasonic Extraction	Completed			8/1/00	8/1/00	DD	SW846 3550B
Petroleum Hydrocarbon Analysis							
<i>EPH Aliphatics/Aromatics</i>							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	39	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
<i>EPH Target PAH Analytes</i>							
Naphthalene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB99091

Collection Date: 7/25/00

Client Id: EP-4 2-4'

Matrix: Soil

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (a) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	113	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	115	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	78	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	77	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
% Solids	79.6	%		8/1/00	8/1/00	DD	SM2540 B Mod

Lab ID No: AB99091

Client Id: EP-4 2-4'

Collection Date: 7/25/00

Matrix: Soil

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
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The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

Matrix	<input type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking
Aqueous Preservative	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> pH \leq 2 <input type="checkbox"/> pH>2 <input type="checkbox"/> pH adjusted to \leq 2 in lab Comment:
Temperature	<input type="checkbox"/> Received on ice <input checked="" type="checkbox"/> Received cold <input type="checkbox"/> Received ambient <input type="checkbox"/> Received with temp blank:

The following outlines the condition of all VPH samples contained within this report upon laboratory receipt.

Matrix	<input type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:	
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking	
Sample Preservative	Aqueous	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> pH \leq 2 <input type="checkbox"/> pH>2 Comment:
	Soil or Sediment	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Samples NOT received in Methanol or air-tight container
		<input checked="" type="checkbox"/> Samples received in Methanol covering soil <input type="checkbox"/> not covering soil
		ml Methanol/g soil <input type="checkbox"/> 1:1 +/- 25% <input checked="" type="checkbox"/> Other: 1:2
Temperature	<input type="checkbox"/> Received on ice <input checked="" type="checkbox"/> Received cold <input type="checkbox"/> Received ambient <input type="checkbox"/> Received with temp blank:	

Were all QA/QC procedures followed as required by the VPH method? Yes ☒ No ☐

Were any significant modifications made to the VPH method, as specified in Section 11.3? No * see below

Were all QA/QC procedures followed as required by the EPH method? Yes ☒ No ☐

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ** see below

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes ☒ No ☐

* Yes, if PID and FID surrogate recoveries are listed as n/a, then that sample was run via GCMS using all QC criteria specified in the method.

** Sample(s) was run via GCMS using all QC criteria specified in the method.

I attest that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Reviewed by:

Validated by:

Quality Service/Quality Assurance Depts.

President/Laboratory Director

8/4/00



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Laboratory Report Supplement
References

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19 th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

Acronyms & Abbreviations

AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	SW	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC / MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



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CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:

- ☐ Standard TAT - 7 to 10 business days
- ☒ Rush TAT - Date Needed: 8/4/00
- All TATs are subject to laboratory approval.
- Min. 24-hour notification is needed for rushes.
- All samples are disposed of after 60 days unless otherwise instructed.

Report To: ECS Invoice To: ECS Project No.: 13597

Project Mgr.: MAH P.O. No.: _____ RQN: _____

Site Name: 115 Wayside Ave State: MA

Location: W Spfld

Sampler(s): LRD

1= $\text{Na}_2\text{S}_2\text{O}_8$ 2= HCl 3= H_2SO_4 4= HNO_3 5= NaOH 6= Δ ascorbic Acid
 7= CH_3OH 8= NaHSO_4 9= _____ 10= _____

DW=Drinking Water GW=Groundwater WW=Wastewater
 SW=Surface Water SO=Soil SL=Sludge O=Oil A=Air
 X1= _____ X2= _____ X3= _____

G=Grab C=Composite				Containers:				Analyses:				Notes:
Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic		
AB 99089	EP-9 12-11	7/28/00	10 AM	G	SO	7	2	1				
AB 99090	EP-2 6-8	7/25/00	2 PM	G	SO	7	2	1				
AB 99091	EP-4 2-4	7/25/00	3 PM	G	SO	7	2	1				
AB												
AB												
AB												
AB												
AB												
AB												
AB												
AB												

Additional Instructions: _____

Relinquished By: David M. [Signature] Received By: D. [Signature]

Date: 7/28/00 Time: 340

☐ Fax results when available to ()

☐ E-mail results when available to _____



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HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138

Rhode Island # 98 Maine # MA138

Florida # E87600 / 87562

New Hampshire # 2538

Connecticut # PH-0777

New York # 11393

ECS, Inc.
588 Silver Street
Agawam, MA 01001

8/8/00

Attn: Mark A. Haynes

Client Project Number: 13997

Location: Commercial Disposal Co-MA

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AB98610	MW-1	VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes
AB98611	MW-2	VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes
AB98612	MW-3	VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes
AB98613	MW-4	VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes
AB98614	Trip	VPH Aliphatics/Aromatics VPH Target Analytes



SPECTRUM ANALYTICAL, INC.

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HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: Commercial Disposal Co-MA

Laboratory ID

Client Sample ID

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method including any data obtained from a subcontract laboratory.

Authorized by:

Hanibal C. Tayeh

President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: Commercial Disposal Co-MA

Client: ECS

Lab ID No: AB98610

Client Id: MW-1

Client Project No: 13997

Submittal Date: 7/24/00

Collection Date: 7/24/00

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>VPH Aliphatics/Aromatics</i>							
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/3/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/3/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/3/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
<i>VPH Target Analytes</i>							
Benzene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/3/00	RLJ	MA VPH 97-12
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	99	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	108	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 3510C
Petroleum Hydrocarbon Analysis							
<i>EPH Aliphatics/Aromatics</i>							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	LR	MA EPH 98-1
<i>EPH Target PAH Analytes</i>							
Naphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	70	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	75	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	86	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	87	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>VPH Aliphatics/Aromatics</i>							
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
<i>VPH Target Analytes</i>							
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	RLJ	MA VPH 97-12
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	89	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	80	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 3510C
Petroleum Hydrocarbon Analysis							
<i>EPH Aliphatics/Aromatics</i>							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	LR	MA EPH 98-1
<i>EPH Target PAH Analytes</i>							
Naphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB98611

Client Id: MW-2

Collection Date: 7/24/00

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	113	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	79	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	88	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	95	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>VPH Aliphatics/Aromatics</i>							
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
<i>VPH Target Analytes</i>							
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	RLJ	MA VPH 97-12
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	91	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	81	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 3510C
Petroleum Hydrocarbon Analysis							
<i>EPH Aliphatics/Aromatics</i>							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	LR	MA EPH 98-1
<i>EPH Target PAH Analytes</i>							
Naphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	64	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	86	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	97	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorobiphenyl Fractionation (%SR)	97	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>VPH Aliphatics/Aromatics</i>							
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
<i>VPH Target Analytes</i>							
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	RLJ	MA VPH 97-12
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	92	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	85	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-12
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 3510C
Petroleum Hydrocarbon Analysis							
<i>EPH Aliphatics/Aromatics</i>							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	MSL	MA EPH 98-1
<i>EPH Target PAH Analytes</i>							
Naphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1

Lab ID No: AB98613

Client Id: MW-4

Collection Date: 7/24/00

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
n-Chloro-octadecane Aliphatic (%SR)	106	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	84	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	105	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	108	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
PH Aliphatics/Aromatics							
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/2/00	CH	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	CH	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	CH	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	CH	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	CH	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
VPH Target Analytes							
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	CH	MA VPH 97-12
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	124	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	95	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
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The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

Matrix	<input checked="" type="checkbox"/> Aqueous	<input type="checkbox"/> Soil	<input type="checkbox"/> Sediment	<input type="checkbox"/> Other:
Containers	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Broken	<input type="checkbox"/> Leaking	
Aqueous Preservative	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> pH ≤ 2	<input type="checkbox"/> pH > 2	<input type="checkbox"/> pH adjusted to ≤ 2 in lab
Temperature	<input type="checkbox"/> Received on ice	<input checked="" type="checkbox"/> Received cold	<input type="checkbox"/> Received ambient	<input type="checkbox"/> Received with temp blank:

The following outlines the condition of all VPH samples contained within this report upon laboratory receipt.

Matrix	<input checked="" type="checkbox"/> Aqueous	<input type="checkbox"/> Soil	<input type="checkbox"/> Sediment	<input type="checkbox"/> Other:
Containers	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Broken	<input type="checkbox"/> Leaking	
Sample Preservative	Aqueous	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> pH ≤ 2	<input type="checkbox"/> pH > 2
	Soil or Sediment	<input checked="" type="checkbox"/> N/A		<input type="checkbox"/> Samples NOT received in Methanol or air-tight container
		<input type="checkbox"/> Samples received in Methanol covering soil		<input type="checkbox"/> not covering soil
		<input type="checkbox"/> Sample received in air-tight container:		
Temperature	<input type="checkbox"/> Received on ice	<input checked="" type="checkbox"/> Received cold	<input type="checkbox"/> Received ambient	<input type="checkbox"/> Received with temp blank:

Were all QA/QC procedures followed as required by the VPH method? Yes ☒ No ☐

Were any significant modifications made to the VPH method, as specified in Section 11.3? No * see below

Were all QA/QC procedures followed as required by the EPH method? Yes ☒ No ☐

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ** see below

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes ☐ No ☐

* Yes, if PID and FID surrogate recoveries are listed as n/a, then that sample was run via GCMS using all QC criteria specified in the method.

** Sample(s) was run via GCMS using all QC criteria specified in the method.

I attest that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Reviewed by:

Validated by:

8/8/00

Quality Service/Quality Assurance Depts.

President/Laboratory Director

Note:

* In order to verify if low-level chlorinated halocarbons are present, resampling is necessary to perform the analysis within the method hold time.



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Laboratory Report Supplement

References

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19 th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

Acronyms & Abbreviations

AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	SW	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC / MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



SPECTRUM ANALYTICAL, INC.

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HANDBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Special Handling:

- ☒ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed: _____
- All TAT's are subject to laboratory approval.
- Min. 24-hour notification is needed for rushes.
- All samples are disposed of after 60 days unless otherwise instructed.

Page 1 of 1

Report To: <u>ECS</u>	Invoice To: <u>ECS</u>	Project No.: <u>12442 13997</u>
Project Mgr.: <u>MAH</u>	P.O. No.: _____	Site Name: <u>Commercial Disposal Co</u>
	RQN: _____	Location: <u>Wayside Ave Spd.</u> State: <u>MA</u>
		Sampler(s): <u>K Dietzler</u>

1=Na₂S₂O₈ 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=Ascorbic Acid
7=CH₃OH 8=NaHSO₄ 9= _____ 10= _____

DW=Drinking Water GW=Groundwater WW=Wastewater
SW=Surface Water SO=Soil SL=Sludge O=Oil A=Air
X1= _____ X2= _____ X3= _____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Containers:	Analyses:	Notes:
Q860	MW-1	7/24	12:30pm	G	GW	2	2	1				UPH	
AB8601	MW-2		1:30pm									X	
AB8602	MW-3		3:00pm									X	
AB8603	MW-4		4:30pm									X	
AB8604	Trip		7:40pm									X	
AB													
AB													
AB													
AB													
AB													

Additional Instructions: <u>per client fax</u> <u>Handwritten notes</u> <u>per client fax</u>	Relinquished By: <u>Paul MDA</u>	Received By: <u>D. P. Mules</u>	Date: <u>7/24</u>	Time: <u>6:38</u>
<input checked="" type="checkbox"/> Fax results when available to (413) 789-2776				



SPECTRUM ANALYTICAL, INC.

Featuring

HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138

Rhode Island # 98 Maine # MA138

Florida # E87600 / 87562

New Hampshire # 2538

Connecticut # PH-0777

New York # 11393

ECS, Inc.

588 Silver Street

Agawam, MA 01001

8/9/00

Attn: Mark A. Haynes

Client Project Number: 13997

Location: 115 Wayside Ave-W. Spfld, MA

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AC00761	MW-1	Purgeable Halocarbons
AC00762	MW-2	Purgeable Halocarbons
AC00763	MW-3	Purgeable Halocarbons
AC00764	MW-4	Purgeable Halocarbons
AC00765	Tripblank	Purgeable Halocarbons

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method including any data obtained from a subcontract laboratory.

Authorized by:

Hanibal C. Tayeh

President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: 115 Wayside Ave-W, Spfld, MA

Client: ECS

Lab ID No: AC00761

Client Id: MW-1

Client Project No: 13997

Submittal Date: 8/8/00

Collection Date: 8/8/00

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>Purgeable Halocarbons</i>							
Bromodichloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromoform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Chloroform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Tetrachloroethene (PCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Vinyl chloride	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
4-Bromofluorobenzene (%SR)	95	ug/L		8/8/00	8/8/00	GM	EPA 601
Chlorobenzene-d5 (%SR)	94	ug/L		8/8/00	8/8/00	GM	EPA 601

Lab ID No: AC00762

Collection Date: 8/8/00

Client Id: MW-2

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>Purgeable Halocarbons</i>							
Bromodichloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromoform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Chloroform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Tetrachloroethene (PCE)	1.4	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Vinyl chloride	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
4-Bromofluorobenzene (%SR)	96	ug/L		8/8/00	8/8/00	GM	EPA 601
Chlorobenzene-d5 (%SR)	95	ug/L		8/8/00	8/8/00	GM	EPA 601

Lab ID No: AC00763

Collection Date: 8/8/00

Client Id: MW-3

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
Purgeable Halocarbons							
Bromodichloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromoform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Chloroform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Tetrachloroethene (PCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Vinyl chloride	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
4-Bromofluorobenzene (%SR)	98	ug/L		8/8/00	8/8/00	GM	EPA 601
Chlorobenzene-d5 (%SR)	96	ug/L		8/8/00	8/8/00	GM	EPA 601

Lab ID No: AC00764

Collection Date: 8/8/00

Client Id: MW-4

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>Purgeable Halocarbons</i>							
Bromodichloromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Bromoform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Chloroform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Tetrachloroethene (PCE)	1.4	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Vinyl chloride	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
4-Bromofluorobenzene (%SR)	124	ug/L		8/9/00	8/9/00	DG	EPA 601
Chlorobenzene-d5 (%SR)	116	ug/L		8/9/00	8/9/00	DG	EPA 601

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
<i>Purgeable Halocarbons</i>							
Bromodichloromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Bromoform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Chloroform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Methylene chloride	Not detected	ug/L	2.5	8/9/00	8/9/00	DG	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Tetrachloroethene (PCE)	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Vinyl chloride	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
4-Bromofluorobenzene (%SR)	117	ug/L		8/9/00	8/9/00	DG	EPA 601
Chlorobenzene-d5 (%SR)	115	ug/L		8/9/00	8/9/00	DG	EPA 601

Lab ID No: AC00765

Client Id: Tripblank

Collection Date: 8/8/00

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
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Reviewed by:

Validated by:

Quality Service/Quality Assurance Depts.

President/Laboratory Director

8/9/00



SPECTRUM ANALYTICAL, INC.

Featuring

HANBAL TECHNOLOGY

Laboratory Report Supplement

References

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19 th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

Acronyms & Abbreviations

AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	SW	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC/MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



SPECTRUM ANALYTICAL, INC.
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CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:

- ☐ Standard TAT - 7 to 10 business days
- ☒ Rush TAT - Date Needed: 8/9/00
- All TATs are subject to laboratory approval.
- Min. 24-hour notification is needed for rushes.
- All samples are disposed of after 60 days unless otherwise instructed.

Report To: <u>ECS</u>	Invoice To: <u>ECS</u>	Project No.: <u>13497</u>
		Site Name: <u>115 W. Weymouth Ave</u>
		Location: <u>W. Springfield</u> State: <u>MA</u>
		Sampler(s): <u>KM12</u>
Project Mgr.: <u>MH</u>	P.O. No.: _____	RQN: _____

1=Na₂S₂O₃ 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=Ascorbic Acid
7=CH₃OH 8=NaHSO₄ 9= _____ 10= _____

DW=Drinking Water GW=Groundwater WW=Wastewater
SW=Surface Water SO=Soil SL=Sludge O=Oil A=Air
X1= _____ X2= _____ X3= _____

G=Grab C=Composite

Lab Id	Sample Id	Date	Time	Type	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Containers:	Analyses:	Notes:
AL00761	MW-1	8/8/00	2pm	G	GW	2						
AL00762	MW-2	8/8/00	2pm	G	GW	2						
AL00763	MW-3	8/8/00	2pm	G	GW	2						
AL00764	MW-4	8/8/00	2pm	G	GW	2						
AL00765	Trip Blank	8/8/00	12pm	G	GW	2						
AB												
AB												
AB												
AB												
AB												

Additional Instructions: _____	Relinquished By: <u>Paul M. St</u>	Received By: <u>D. K. Maclellan</u>	Date: <u>8/8/00</u>	Time: <u>426</u>
<input type="checkbox"/> Fax results when available to (____)				
<input type="checkbox"/> E-mail results when available to _____				

APPENDIX B

ECS Protocols

DRILLING EQUIPMENT STANDARDS

1. EQUIPMENT DECONTAMINATION

All drilling equipment and associated tools, including but not limited to, augers, flush-threaded casing, drill rods, sampling equipment, wrenches, etc., that may have come in contact with any material which could cause contamination shall be decontaminated using a high pressure detergent steam cleaning equipment, followed by, if needed a nanograde methanol swabbing. This will be followed by a distilled or controlled water rinse. The control water shall be obtained from a source approved by the supervising field representative.

2. EQUIPMENT AND MATERIALS

All equipment will be in good repair and in proper working order with no visible signs of oil or hydraulic fluid leaks.

The drill rig shall be capable of providing a power driven sectional hollow stem auger and/or flush-threaded casing with a minimum inside diameter of 2 1/2 inches to a minimum depth of 60 feet. In addition, the following equipment shall be available:

- Drill Rods, minimum size equivalent to the "A" Rod, (1 5/8 inches O.D. and 1 1/8 I.D.);
- 1lb. Drive Hammer and 300 lb. Drive Hammer;
- Split-spoon Samplers;
- Hollow Stem Auger Plug;
- Roller Bit and Diamond Corer Bit;
- Water Tank and Pump;
- Any other equipment needed to successfully complete job.

MONITORING WELL CONSTRUCTION PROCEDURE

The following Monitoring Well construction procedures are based on standard methods found in the Massachusetts Department of Environmental Protection (DEP) "Standard References for Monitoring Wells" (WSC-310-91) and the United States Environmental Protection Agency (EPA) "Subsurface Characterization and Monitoring Techniques: Volume 1" (EPA/625/R-93/00300)

1. MONITORING WELL MATERIALS

All materials used in the completion of monitoring wells shall be in good condition and free of any signs of possible contamination. The following materials may be used in the completion of monitoring wells.

- Schedule 40, flush-joint threaded PVC slotted well screen and solid riser
- Clean silica sand (graded appropriately for site-specific formation; No. 2 typical)
- Bentonite pellets and grout
- Portland Cement
- Flush-mounted curb box or vented steel locking aboveground protective well-casing and lock.

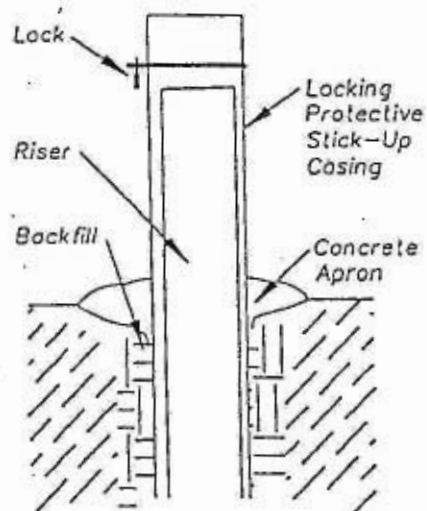
The attached Figure depicts a typical well construction schematic.

2. PROCEDURES

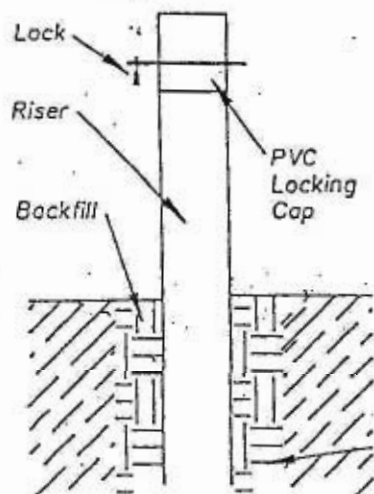
- Upon establishing the bottom elevation of the monitoring well, followed by the placement of a specified length of well screen and riser within the drill casing. If warranted, filter fabric may be placed on the screen prior to insertion into the drill casing to facilitate filtration. The sand pack will then be continuously added to the annular space as the drill casing are withdrawn. The drill casing will not be pulled above the sand as it is added, ensuring the placement of a continuous sand pack. A weighted tape will be used to continuously monitor the sand pack elevation relative to the auger bottom to ensure the screen has been fully covered. Unless otherwise specified, the sand pack will be placed to an elevation of two feet above the top of the well screen.
- A one-foot (or greater if specified) thick bentonite seal composed of pellets or chips will be added to the annular space. If the seal is placed above the water table, the pellets will be hydrated with potable water. A weighted tape will be used to assure that the bentonite is placed at the proper elevation, is the proper thickness, and is not hung up in the borehole. The drill casing will be withdrawn from above the elevation of the bentonite seal and the natural materials will be allowed to collapse, if specified. If natural materials are not collapsing, clean native materials or No. 2 silica sand will be used to fill the voids.

- From the top of the bentonite seal to two feet below grade, the annular space will be backfilled with natural materials unless other materials are specified.
- If well is to be screened below the water table, the annular space above the bentonite seal is to backfilled with a cement/bentonite grout, mixed according to a ratio of approximately 20:1 cement to bentonite (not less than 5:1, if porous formations require more bentonite), with a maximum of 8 gallons of water per 94-pound bag of cement. Grout to be put in place with a sideways or upwards discharging tremie pipe.
- Each well will be completed with either a flush mount or elevated locking, protective casing as specified. Any asphalt or concrete surface will be square-cut. The flush mount casings will be set in Portland cement that extends from the top of the native fill to ground surface. The cement seal shall be a minimum of 2 feet in diameter. The top of the cement surface will be tapered outward to drain water away from the well.
- A vent hole will be placed near the top of a solid riser. On wells with a flush mount protective casing, a vented, locking compression cap will be used to plug the PVC riser. The wells requiring an aboveground protective casings will be completed with a vented slip-on PVC cap and locking metal cover.

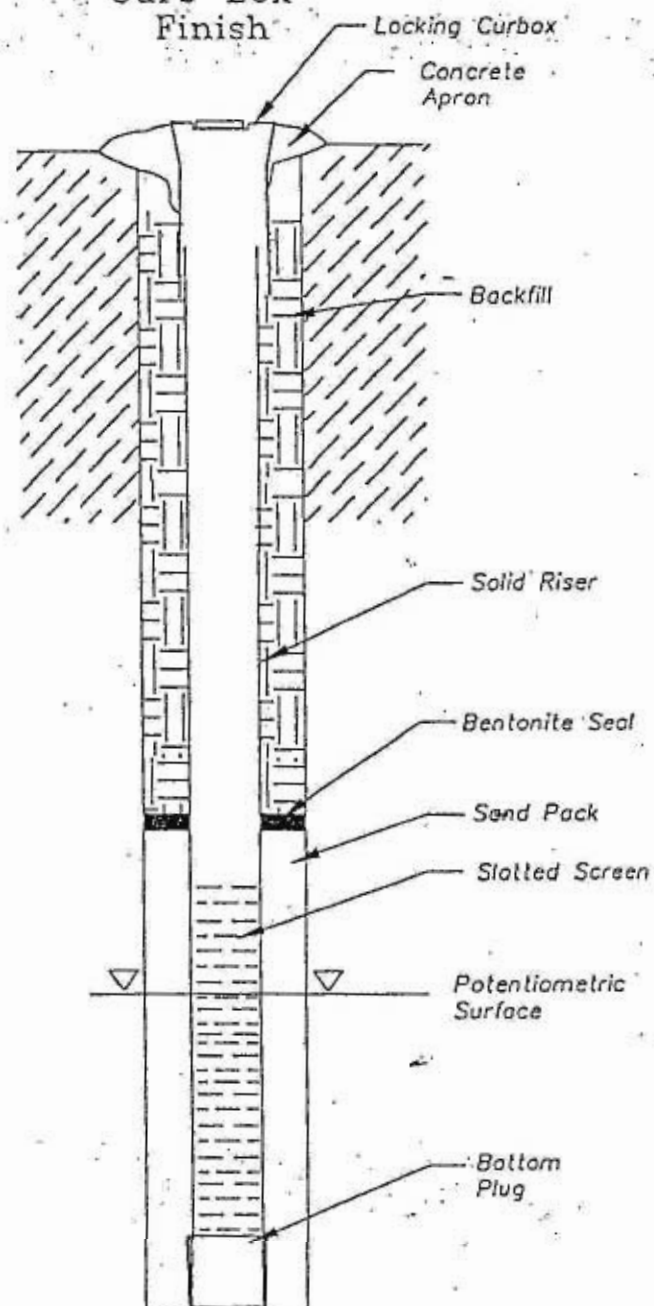
Locking Protective Pipe Finish



Locking PVC Cap Finish



Curb-Box Finish



GROUNDWATER MONITORING WELL With Alternative Finishings



Environmental Compliance Services, Inc.
588 Silver Street, Agawam, Massachusetts 01001

SOIL BORING and MONITORING WELL INSTALLATION LOG

BORING NO.:
DOCUMENT NO.:
SHEET 1 OF 1

BORING COMPANY: Environmental Compliance Services, Inc.
BORING COMPANY: 588 Silver Street, Agawam, Massachusetts
FOREMAN:
ECS INSPECTOR:

JOB NUMBER:
PROJECT NAME:
PROJECT ADDRESS:
CLIENT NAME:

LOCATION

Draw Here

GROUNDWATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL		
Date	Depth	Stabilization Time	TYPE	Hollow Stem Auger	Split Spoon		Casing Elevation (ft.)	
			INSIDE DIAMETER	4.25"	1 3/8"		PVC Elevation (ft.)	
			HAMMER WEIGHT		140 lbs		Surface Elevation (ft.)	
			HAMMER FALL		30"		Date Started	
			NOTES:				Date Completed	

Depth	Sample Number	Sample Depths	Penetration/ Recovery	Blows per 6" penetration	Strata Changes	Soil Descriptions	Well As Built	Field Testing	Notes
0		0 - 2							
5		5 - 7							
10		10 - 12							
15		15 - 17			15' END OF BORING				
20		20 - 22							
25		25 - 27							
30		30 - 32							
35		35 - 37							

1. Field testing values represent total volatile organic vapors (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an H-Nu Model PIO Photoionization Meter. Results reported in parts per million (ppm). Detection limit = 0.2 ppm. BDL = Below Detection Limit.

2. Groundwater encountered at approximately 7 feet below grade.

3. Completed at 15' as a 2" diameter monitoring well, 10' of 0.010" slotted screen, 5' of solid riser, sand pack between 15' and 4', bentonite seal from 4' to 3', natural fill to surface, casing and cement flush to ground surface.

Well sand.

Bentonite seal.

Natural Fill.

Well screen.

GENERAL SAMPLING PROCEDURES FOR AQUEOUS AND SOLID MATRICES

- During field sampling activities, the following applicable procedures will be practiced for sample collection:
- Whenever possible, samples will be collected first from the location expected to be least contaminated. Samples that are expected to be most contaminated will be collected last.
- Accurate and detailed field notes will be maintained in a bound field notebook. Soil samples will be examined and logged in the field.
- Sampling procedures will be performed with the overall intent of collecting representative samples and minimizing sample disturbance.
- Soil samples will be selected for analysis based on the results of qualitative field screening for total volatile organic vapors, visual and olfactory observations, and the depth of the water table.
- Sample containers will be labeled with the site name, project number and date prior to being filled with a sample.
- All sample collection, handling, and shipping information will be recorded in a field notebook.
- Groundwater samples will be logged, using the attached *Groundwater Sampling Log*. Samples of other matrices (sediment, surface water, soil, etc.) will be logged, using the attached *Field Sampling Log*.
- All samples should be collected according the specific requirements of the intended analytical method. Tables 1 and 2 provide lists of sample containers, preservation and holding time requirements for aqueous and soil/sediment samples, respectively.
- All samples will be placed in a chilled, thermally-insulated container containing ice. Blue ice, ice packs, or ice substitutes are not able to reach and maintain the required temperature until receipt at a laboratory.
- All soil samples for volatile organic compound analysis must be collected, preserved, and handled accordingly to SW846 Method 5035. The procedures are outlined in attached memorandum from Spectrum Analytical.
- All samples to be analyzed by Massachusetts Department of Environmental Protection methodologies for Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) will be collected according the published MADEP procedures outlined in the attached memorandum from Spectrum Analytical, Inc.

WELL SAMPLING LOG

Sheet 1 of 1

Weather Conditions:

[illegible]

D = Well diameter in inches.

(413) 789 - 3530

FIELD SAMPLING LOG

Sheet
of

CLIENT: _____

JOB No: _____

LOCATION: _____

DATE: _____

SAMPLER (S): _____

WEATHER CONDITIONS: _____

[illegible]

FIELD INSTRUMENTATION:

INSTRUMENT:

MANUFACTURER/MODEL:

ECS EQUIPMENT
I.D. NUMBER

CALIBRATION:

SAMPLING EQUIPMENT



SPECTRUM ANALYTICAL, INC.

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Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Volatile/Semivolatile Analyses						
Ethylene Dibromide (EDB)	504.1	H ₂ O	G (b) Tef Sep	Cool 4° C 75µL Na ₂ S ₂ O ₃ Solution	14 days	40 ml ^{3,4}
GC-Purgeable Halocarbons	601	H ₂ O	G (b) Tef Sep	Cool 4° C HCl to pH<2 ²	14 days	40 ml ^{3,4}
GC-Purgeable Aromatics	602	H ₂ O	G (b) Tef Sep	Cool 4° C HCl to pH<2 ^{2,3}	14 days ⁵	40 ml ^{3,4}
GC-Pesticides & PCBs	608	H ₂ O	AG (a) Tef Cap	Cool 4° C NaOH or H ₂ SO ₄ to pH 5-9 ²	7/40 days ⁶	1 L ^{3,4}
HPLC or GC-PAHs	610	H ₂ O	AG (a) Tef Cap	Cool 4° C ²	7/40 days ⁶	1 L ^{3,4}
GC/MS Purgeables	624 524.2	H ₂ O	G (b) Tef Cap	Cool 4° C HCl to pH<2 ^{2,5}	14 days ⁵	40 ml ^{3,4}
GC/MS Semivolatiles	625	H ₂ O	AG (a) Tef Cap	Cool 4° C	7/40 days ⁶	1 L ^{2,3}
Petroleum Hydrocarbon Analyses						
Oil & Grease	413.1 413.2 1664	H ₂ O	AG (a) Tef Cap	Cool 4° C H ₂ SO ₄ to pH<2	28 days ⁷	1 L ³
Total Recoverable Petroleum Hydrocarbons by IR	418.1	H ₂ O	AG (a) Tef Cap	Cool 4° C HCl to pH<2	28 days ⁷	1 L ³
Diesel Range Organics (DRO)	Modified 8015B	H ₂ O	G (b) Tef Cap	Cool 4° C HCl to pH<2	14/40 days ⁶	1 L ³
Gasoline Range Organics (GRO)	Modified 8015B	H ₂ O	G (b) Tef Sep	Cool 4° C HCl to pH<2	14 days	40 ml ^{3,4}
Total Petroleum Hydrocarbons by GC	Modified 8100	H ₂ O	G (a) Tef Cap	Cool 4° C HCl to pH<2	14/40 days ⁶	1 L ³
Total Petroleum Hydrocarbons by GC	Florida Pro	H ₂ O	G (a) Tef Cap	Cool 4° C HCl to pH<2	14/40 days ⁶	1 L ³
MA DEP EPH	98-1	H ₂ O	See Table 3			
MA DEP VPH	97-12	H ₂ O	See Table 4			
CT DPH ETPH	8015B	H ₂ O	See Table 5			

ENVIRONMENTAL ANALYSES

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Metal Analyses						
AA Metals	200 Series	H ₂ O	P or G (c)	Cool 4° C HNO ₃ to pH<2 ⁸	6 months	250 ml
ICP Metals	200.7	H ₂ O	P or G (c)	Cool 4° C HNO ₃ to pH<2 ⁸	6 months	250 ml
Mercury	245.1	H ₂ O	P or G (c)	Cool 4° C HNO ₃ to pH<2 ⁸	28 days ⁹	250 ml
Chromium VI	218.4	H ₂ O	P or G	Cool 4° C	24 hours	200 ml
Lead, Organic	CA LUFT	H ₂ O	G (a) Tef Cap	Cool 4° C	Analyze immediately	1 L ³
Inorganic/Wet Chemistry Analyses						
Ion Chromatography Anions	300.0	H ₂ O	P or G	Cool 4° C	28 days ¹⁰	500 ml
Acidity	305.1	H ₂ O	P or G	Cool 4° C	14 days	150 ml
Alkalinity	310.1	H ₂ O	P or G	Cool 4° C	14 days	150 ml
BOD	405.1	H ₂ O	P or G	Cool 4° C	48 hours	1 L
Bromide	320.1	H ₂ O	P or G	Cool 4° C	28 days	100 ml
BTU	ASTMD 240	H ₂ O	P or G	Cool 4° C	28 days	50 ml
Carbon Dioxide	SM4500CO ₂ D	H ₂ O	P or G	Cool 4° C	Analyze immediately	100 ml
Chloride	325.1	H ₂ O	P or G	None Required	28 days	150 ml
Chlorine, Total Residual	330.1	H ₂ O	P or G	None Required	Analyze immediately	200 ml
COD	410.4	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	50 ml
Coliform, Fecal	SM 9220	H ₂ O	Sterile Plastic	Cool 4° C ²	6 hours	100 ml
Coliform, Fecal Strep	SM 9230	H ₂ O	Sterile Plastic	Cool 4° C ²	6 hours	100 ml
Coliform, Total	SM 9222	H ₂ O	Sterile Plastic	Cool 4° C ²	30 hours	100 ml
Coliform, Standard Plate Count	SM 907C	H ₂ O	Sterile Plastic	Cool 4° C ²	24 hours	100 ml
Color	110.2	H ₂ O	Sterile Plastic	Cool 4° C	48 hours	200 ml
Conductance, Specific	120.1	H ₂ O	P or G	Cool 4° C	24 hours	100 ml
Cyanide, Amenable	335.1	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Cyanide, Physiologically Available	335.3	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Cyanide, Total	335.4	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Cyanide, Weak Acid Dissociable	SM4500 CN-I	H ₂ O	P or G (a)	Cool 4° C NaOH to pH>12 ²	14 days	500 ml
Flash Point	1010	H ₂ O	P or G	Cool 4° C	ASAP	50 ml
Fluoride	340.2	H ₂ O	P or G	None Required	28 days	200 ml

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Hardness	130.1 130.2	H ₂ O	P or G	Cool 4° C HNO ₃ to pH<2	6 months	100 ml
Iodide	345.1	H ₂ O	P or G	Cool 4° C	24 hours	100 ml
MBAS (Surfactants)	425.1	H ₂ O	P or G	Cool 4° C	48 hours	250 ml
Nitrogen, Ammonia	350.1 350.2	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	400 ml
Nitrogen, Total Kjeldahl	351.1 351.3	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	500 ml
Nitrogen, Nitrate	352.1	H ₂ O	P or G	Cool 4° C	48 hours	250 ml
Nitrogen, Nitrate plus Nitrite	353.2 353.3	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	100 ml
Nitrogen, Nitrite	354.1	H ₂ O	P or G	Cool 4° C	48 hours	100 ml
Odor	140.1	H ₂ O	G	Cool 4° C	24 hours	500 ml
Orthophosphate	365.2	H ₂ O	P or G	Filter immediately Cool 4° C	48 hours	100 ml
Oxygen, Dissolved	360.1 360.2	H ₂ O	G Bottle and Top	None Required	Analyze immediately	300 ml
pH, Hydrogen ion	150.1 150.2	H ₂ O	P or G	None Required	Analyze immediately	25 ml
Phenolics	420.1	H ₂ O	G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	1 L ³
Phosphorous, Total	365.2	H ₂ O	P or G	Cool 4° C H ₂ SO ₄ to pH<2	28 days	500 ml
Phosphorous, Dissolved	365.2	H ₂ O	P or G	Filter immediately Cool 4° C H ₂ SO ₄ to pH<2	24 hours	500 ml
Residue, Filterable (TDS)	160.1	H ₂ O	P or G	Cool 4° C	7 days	300 ml
Residue, Non-filterable (TSS)	160.2	H ₂ O	P or G	Cool 4° C	7 days	300 ml
Residue, Total	160.3	H ₂ O	P or G	Cool 4° C	7 days	300 ml
Residue, Volatile	160.4	H ₂ O	P or G	Cool 4° C	7 days	100 ml
Salinity	S210A	H ₂ O	P or G	Cool 4° C	28 days	100 ml
Silica	200.7	H ₂ O	P	Cool 4° C	28 days	200 ml
Settleable Solids	160.5	H ₂ O	P or G	Cool 4° C	48 hours	1 L
Specific Gravity	ASTM D1298	H ₂ O	P or G	Cool 4° C	28 days	500 ml
Sulfate	375.2	H ₂ O	P or G	Cool 4° C	28 days	300 ml
Sulfide	376.1	H ₂ O	P or G	Cool 4° C pH>9 ¹¹	7 days	500 ml
Sulfite	377.1	H ₂ O	P or G	None Required	Analyze immediately	100 ml
Temperature	170.1	H ₂ O	P or G	None Required	Analyze immediately	1 L

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Total Organic Carbon (TOC)	415.1	H ₂ O	AG (a)	Cool 4° C H ₂ SO ₄ to pH<2	28 days	40 ml
Total Organic Halogens (TOX)	SW 9020B	H ₂ O	AG	Cool 4° C	28 days	200 ml
Turbidity	180.1	H ₂ O	P or G	Cool 4° C	48 hours	100 ml

Notes:

- 1 G (x) = glass; AG (x) = amber glass; P (x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
- 2 For organics and bacteriological analysis, sodium thiosulfate is required for all chlorinated waters. For cyanide, use 0.6g ascorbic acid. Dechlorination must be performed prior to the addition of any necessary preservative.
- 3 Samples must be provided in duplicate to cover for breakage and provide sufficient sample for QC procedures. Extractable organics with matrix spike/matrix spike duplicate QC protocols require a triplicate sample.
- 4 Fill completely to avoid volatile loss.
- 5 Samples with purgeable aromatics must be acidified with HCl to pH<2 in order to have a 14-day holding time.
- 6 Holding time is seven days from sample collection date for extraction, 40 days from extraction date for analysis of the extract. Holding time is fourteen days for extraction if listed as 14/40.
- 7 The EPA has not recommended petroleum hydrocarbon holding times. The holding time given is the laboratory practice by analogy with Oil and Grease standards. State of New Jersey holding time is 7 days. California LUFT is 14 days.
- 8 For the determination of dissolved elements, the sample must be filtered through a 0.45 µm pore diameter membrane filter (prior to acidification) at the time of collection or as soon thereafter as practically possible and acidified immediately thereafter.
- 9 The EPA allows only 14 days holding time for mercury in plastic bottles for drinking water analysis.
- 10 Certain anions require special handling. Holding times and preservation for a particular sample will be determined by the requirement for the anion of interest with the shortest holding time; e.g., nitrate and nitrite - 48 hours; orthophosphate-filter and 48 hours.
- 11 Zinc acetate and NaOH to pH>9.

Table 2
Recommended Containers, Preservation, Storage, & Holding Times
For Soil, Solids, and Wastes

Description	Method	Matrix	Sample Container ¹	Preservative	Prep/Analysis Holding Time	Volume
Volatile/Semivolatile Analyses						
GC-Purgeable	8021B	Soil/Waste	G (b) Tef Sep	See Memo ⁹	14 days	See Memo ⁹
GC/MS- Purgeables	8260C	Soil/Waste	G (b) Tef Sep	See Memo ⁹	14 days	See Memo ⁹
GC-Pesticides & PCBs	8081A/8082	Soil/Waste	AG (a) Tef Cap	Cool 4° C	14/40 days ³	100 g or 8 oz Jar
GC/MS-Semivolatiles – PAHs Base Neutral/Acid Extractable	8270C	Soil/Waste	AG (a) Tef Cap	Cool 4° C	14/40 days ³	100 g or 8 oz Jar
Petroleum Hydrocarbon Analyses						
Oil & Grease	Modified 413.2	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Total Recoverable Petroleum Hydrocarbons	Modified 418.1	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Diesel Range Organics (DRO)	Modified 8015B	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Gasline Range Organics (GRO)	Modified 8015B	Soil	G (b) Tef Sep	Cool 4° C 15 ml CH ₃ OH	14 days	15 g ²
Total Hydrocarbons by GC	Modified 8100	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
Total Hydrocarbons by GC	Florida Pro	Soil	G (a) Tef Cap	Cool 4° C	14/40 days ^{3,4}	100 g or 8 oz Jar
MA DEP EPH	98-1	Soil	See Table 3			
MA DEP VPH	97-12	Soil	See Table 4			
CT DPH ETPH	8015B	Soil	See Table 5			
Metal Analyses						
Metals-AA	7000 Series	Soil	P or G (c)	Cool 4° C	6 months	100 g or 8 oz Jar
ICP Metals	6010B	Soil	P or G (c)	Cool 4° C	6 months	100 g or 8 oz Jar
Mercury	7471A	Soil	P or G (c)	Cool 4° C	28 days	100 g or 8 oz Jar
Lead, Organic	CA LUFT	Soil	G (a) Tef Cap	Cool 4° C	Analyze immediately	200 g or 8 oz Jar
General Inorganic Analyses						
General Inorganics	9000 Series	Soil	P or G (c) ⁵	Cool 4° C	Not to exceed Table 1 specifications	100 g or 8 oz Jar
Asbestos (Bulk)	EPA Interim Method	Bulk	G (a) Tef Cap	None	Indefinite	50 g minimum

Table 2
Recommended Containers, Preservation, Storage, & Holding Times
For Soil, Solids, and Wastes

Description	Method	Matrix	Sample Container ¹	Preservative	Prep/Analysis Holding Time	Volume
BTU	ASTMD 240 SM 403	Soil	P or G	Cool 4° C	28 days	50 g
Flashpoint/Ignitability	1010	Soil	G (b) Tef Sep or G (a) Tef Cap	Cool 4° C	ASAP	100 g or 8 oz Jar ⁶
pH/Corrosivity	9040B 9045C	Soil/Waste	P or G	Cool 4° C	ASAP ⁷	100 g or 2 oz Jar ²
Reactivity	SW 846 Section 7.3	Soil/Waste	P or G	Cool 4° C	ASAP ⁷	100 g or 8 oz Jar
Standard Plate Count	907C	Soil/Solid/ Waste	Sterile Plastic	Cool 4° C	24 hours	100 g
TCLP/SPLP	1311/1312	Soil/Waste	Inorganics - P or G (c) or (a) Organics - G (a)	Cool 4° C if appropriate	varies by method	500 g or 32oz Jar ^{2,3}
Total Organic Carbon (TOC)	9060	Soil	G (a) Tef Cap	Cool 4° C	28 days	100g or 8 oz Jar
Total Organic Halogens (TOX)	9020B	Soil	G (a) Tef Cap	Cool 4° C	14 days	100g or 8 oz Jar

Notes:

- ¹ G (x) = glass; AG (x) = amber glass; P (x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap;
x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
- ² Fill completely to avoid volatile loss; if pre-weighted VOA vials are used, sample cannot exceed half volume of the vial.
- ³ Holding time is fourteen days from sample collection date for extraction, 40 days from extraction date for analysis of extract.
- ⁴ EPA has not recommended oil and grease, petroleum hydrocarbons or EDB holding times in soil. The holding time is given by analogy to extractable organics.
- ⁵ Acid washed containers are not appropriate for nitrate and other N analysis. Use glass container ordered with cleaning protocol (1-Chem V220-0250, or equivalent).
- ⁶ Fill completely to avoid volatile loss. If vials are used, a minimum of 4 is required.
- ⁷ Holding time is not to exceed 14 days. If sulfide reactivity is sought, then not to exceed 7 days.
- ⁸ TCLR samples with liquid require more sample volume. For example, a sample with 10% solids requires a minimum of 2000g. Aqueous samples should routinely be provided as 3 liters in order to cover for breakage and provide enough sample for laboratory QC.
- ⁹ Refer to Spectrum Analytical Memorandum (M-020) dated March 12, 1999.

Table 3
Recommended Containers, Preservation, Storage, & Holding Times
For MA DEP EPH Samples

Matrix	Container	Preservative	Holding Time
Aqueous	1 liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days
Soil/Sediment	4-oz (120 ml) wide mouth amber glass jar with Teflon-lined screw cap	Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days

Table 4
Recommended Containers, Preservation, Storage, & Holding Times
For MA DEP VPH Samples

Matrix	Container	Preservative	Holding Time
Aqueous	2 - 40 ml VOA vials with Teflon-lined screw caps	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	14 days
Soil/Sediment	2 - 40 ml VOA vials with Teflon-lined screw caps	Add 15 g of soil to pre-weighed, laboratory preserved VOA vials on site; additional sample without preservative is needed to figure dry weight calculation; Cool to 4° C	28 days

Table 5
Recommended Containers, Preservation, Storage, & Holding Times
For CT DPH ETPH Samples

Matrix	Container	Preservative	Holding Time
Concentrated Waste Sample	125 ml wide mouth glass container with Teflon lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days
Water Samples with No Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days
Water Samples with Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 ml 10% Na ₂ S ₂ O ₃ solution per gallon. Add 3 to 4 drops of 1:1 HCl; Cool to 4° C*	Samples must be extracted within 7 days and analyzed within 40 days
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon lined lid	Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days

* Dechlorination must be performed prior to the addition of any necessary preservative.



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Memorandum

(M-137)

To: All Spectrum Analytical Clientele

From: Sample Department

Date: January 28, 1998

Subject: Connecticut DEP TPH/GC Method

The following details sample collection, preservation, and handling guidelines for the Connecticut DEP Method, The Analysis of Total Petroleum Hydrocarbons Using Methylene Chloride Extraction and Gas Chromatograph/Flame Ionization Detection as prepared by the Environmental Research Institute of the University of Connecticut, September, 1997.

Recommended Containers, Preservation, Storage, & Holding Times For CT DEP TPH Samples			
Matrix	Container	Preservative	Holding Time
Concentrated Waste Sample	125mL wide-mouth glass container with Teflon lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days
Water Samples with No Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Teflon-lined lids	Cool to 4°C	Samples must be extracted within 7 days and analyzed within 40 days
Water Samples with Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Teflon-lined lids	Add 3 ml 10% $\text{Na}_2\text{S}_2\text{O}_3$ solution per gallon. Cool to 4°C	Samples must be extracted within 7 days and analyzed within 40 days
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon-lined lid	Cool to 4°C	Samples must be extracted within 14 days and analyzed within 40 days

ENVIRONMENTAL ANALYSES



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Memorandum

(M-020)

Important! Please copy and distribute to all Project Managers and Samplers!

To: All Spectrum Analytical Clientele
From: Sample Department
Date: March 12, 1999
Subject: New Sample Collection Techniques for VOC Soils

The following details Spectrum Analytical's policy regarding the collection, preservation, and handling of soil samples submitted for Volatile Organic Compounds (VOCs). These guidelines are in accordance with SW846 Method 5035 for Volatile Organics in Soil and Waste Samples. The Massachusetts Department of Environmental Protection beginning March 15, 1999 will strictly enforce these guidelines. Data for soil samples not properly preserved in accordance with specified guidelines will be rejected by the MA DEP.

The accurate sample collection technique depends on the expected concentration of VOCs in the sample. Techniques are group by three categories of sample types: low VOC concentration, high VOC concentration and oily waste samples.

Low concentration soil samples ($< 200 \mu\text{g/Kg}$ or $< .2 \text{ mg/Kg}$)

1. All samples must be collected in a manner that minimizes sample handling and agitation.
2. Samples must be collected in 20ml VOA vials containing 5ml of sodium bisulfate solution provided by Spectrum Analytical.
3. During collection approximately 5 grams of soil must be added to the pre-measured, pre-weighed sodium bisulfate vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
4. Store samples on ice at 4°C until transport to the laboratory facility.
5. Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.

ENVIRONMENTAL ANALYSES

6. In addition, a third VOA vial (40ml) must be collected for screening, dry weight determination and high concentration analysis (if necessary). This third vial must not contain any sample preservation solution.

High concentration soil samples ($> 200 \mu\text{g/Kg}$ or $> .2 \text{ mg/Kg}$)

1. All samples must be collected in a manner that minimizes sample handling and agitation.
2. Samples must be collected in 40ml VOA vials containing 15ml of purge and trap grade methanol provided by Spectrum Analytical.
3. During collection approximately 10-15 grams of soil must be added to the pre-measured, pre-weighed methanol vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
4. Store samples on ice at 4°C until transport to the laboratory facility.
5. Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.
6. In addition, a third VOA vial (40ml) must be collected for screening and dry weight determination. This third vial must not contain any sample preservation solution.

Oily waste samples

The collection of oily samples depends on knowledge of the waste and its solubility in methanol.

1. If the oily waste is known to be soluble in methanol, collect the sample in accordance with the technique noted for high concentration soils.
2. If the solubility of the oily waste is not known, the sample should either be collected in a vial without a preservative filling the container as full as possible in order to minimize volatile loss in the headspace, or test the solubility of a trial sample in the field. If the trial sample is soluble in methanol, collect the sample in accordance with the technique noted above for high concentration soils. Otherwise, collect an unpreserved sample as described above.

In order to alleviate uncertainties regarding which sample collection technique to use, Spectrum Analytical recommends the collection of all soil samples in accordance with both low and high concentration techniques. Please make certain to submit an additional VOA vial without any sample preservation solution for screening and dry weight determination.

The aforementioned sample containers are immediately available upon request from the laboratory. Be advised to clearly note which preservative is needed when requesting containers, otherwise HCl preserved VOA vials will be provided if no preservative is specified.



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Memorandum

(M-017)

To: All Spectrum Analytical Clientele

From: Sample Department

Date: March 2, 1999

Subject: Sample Collection, Preservation and Handling

Collection of Samples in Duplicate

The collection of a sample in duplicate is requested when submitting a series of five or more samples per Chain of Custody. Collecting double the volume of a sample will enable us to perform additional quality control procedures in the laboratory. This practice may also be utilized when submitting samples for a project requiring additional quality control information.

Dechlorination of Samples

Clients are urged to carefully follow all preservation guidelines as specified in each applicable method. It has been brought to our attention that government agencies are strictly enforcing these guidelines including sample dechlorination. If residual chlorine is present in a sample, follow the instructions outlined below. Pay close attention to the order in which reagents are added to the sample. A brief synopsis of dechlorinating reagents by method is given for your referenced.

EPA 524.2

Add 25 mg of ascorbic acid to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

EPA 502.2

Add 25 mg of ascorbic acid or 3 mg of sodium thiosulfate to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

ENVIRONMENTAL ANALYSES

EPA 504.1

Add 3 mg of sodium thiosulfate crystals or 75 μ l of sodium thiosulfate solution to sample vials before filling. Seal the vial taking care not to trap any air bubbles. The addition of acid to sample vials is not recommended. Collect samples in duplicate 40ml VOA vials.

EPA 608

If necessary, samples should be adjusted to a pH range of 5.0 to 9.0 with sodium hydroxide or sulfuric acid. If aldrin is to be determined, add sodium thiosulfate when residual chlorine is present. Collect samples in 1 liter glass containers.

EPA 625

If residual chlorine is present, add 80mg of sodium thiosulfate per each liter of water. Collect samples in 1 liter amber glass containers.

The EPA recommends the use of sodium thiosulfate as the dechlorinating reagent in the event that a method allows the use of more than one dechlorinating reagent. One exception to this recommendation is ascorbic acid must be used when vinyl chloride and other gases are measured with a mass spectrometer.

The aforementioned reagents are available from the laboratory. Upon request, VOA vials containing the pre-measured amount of reagent as specified in the method may be supplied. A separate vial containing HCl will be provided for final pH adjustment to <2 when applicable. Be advised to clearly note this requirement when requesting containers, otherwise, HCl preserved VOA vials will be provided.

Cooling of Samples

Samples must be chilled to 4°C immediately following collection and packed with a sufficient amount of ice to maintain that temperature until receipt at laboratory facility. EPA protocols do not allow the use of icepacks or ice substitutes because they are unable to reach a cold enough temperature.

Laboratories are required to maintain a record of sample temperature as received. In the event that no temperature blank is submitted with the sample(s), an observation must be made as to whether the sample(s) is cold or ambient upon receipt. A notation of the observed temperature is made on the duplicate of the Chain of Custody for our records. Samples received on ice will be noted as such. Where upon samples are transferred from a refrigerator, the temperature will be recorded as cold and refrigerated.

Sample Integrity

Spectrum Analytical is committed to maintaining the integrity of all samples submitted for laboratory analyses. Spectrum has a set criterion that all samples must pass in order to be considered to be of satisfactory condition. The Sample Department will notify the client via facsimile of any samples that may be considered to be of unsatisfactory condition. Analysis of unsatisfactory samples will be conducted only with the written authorization from the client.



The following details Spectrum's policy regarding collection, preservation and handling of all samples that are submitted for VPH and/or EPH analysis. These guidelines are in accordance with Massachusetts DEP Method for the determination of Volatile (VPH) and Extractable (EPH) Petroleum Hydrocarbons, January 1998.

Sample Collection, Preservation, and Handling for VPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

A Chain of Custody must accompany all samples submitted for analysis, documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 1.

Aqueous Samples

1. Aqueous samples should be collected in duplicate without agitation and without headspace in contaminate-free, HCl preserved, 40ml VOA vial with Teflon-lined septa screw caps. The Teflon liner must come in contact with the sample.
2. The laboratory must determine the pH of all water samples unless the laboratory (this must be noted on the Chain of Custody) supplied the sample vials containing acid for field preservation. The pH measurement may be performed on leftover sample. Any sample found to have a pH above 2.0 must be so noted on the laboratory/data report sheet.
3. A reagent trip blank should accompany each batch of water samples.
4. Aqueous samples must be analyzed within 14 days of collection.

Soil Samples

1. Soil samples must be collected in a manner that minimizes sample handling and agitation. Samples must be in a Methanol-preserved 40ml VOA vial that is provided by Spectrum. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.

ENVIRONMENTAL ANALYSES

2. *Methanol preservation of soil samples is mandatory.* Methanol (purge and trap grade) must be added to the sample vial before or immediately after sample collection. Spectrum will provide pre-weighed 40ml VOA vials containing 15 ml of purge and trap grade Methanol for in-field preservation of VPH samples. In lieu of in-field preservation with methanol, soil samples may be obtained in specially-designed, air-tight sampling devices provided that the samples are extruded and preserved in methanol within 48 hours of collection. Additional details and recommendations on soil sampling are provided in Appendix 4.
3. During collection, approximately 15 grams (+/- 25%) of soil must be added to exactly 15ml of Methanol. This may be accomplished visually by adding soil until the layer of soil is approximately equal or just less than the layer of preservative. *In all cases, the soil sample in the vial must be completely covered by methanol.*
4. Samples for VPH analysis should be collected in duplicate 40ml vials. An additional sample of soil should also be obtained (without Methanol) to allow for a determination of soil moisture content and VPH dry weight correction factors. (Remaining soil from EPH method will be sufficient to calculate soil moisture content if applicable).
5. A Methanol trip blank should accompany each batch of samples.
6. Observations of vial leakage must be so noted on the laboratory/data report sheet.
7. Soil and sediment samples must be analyzed within 28 days of collection.

TABLE 1
HOLDING TIMES AND PRESERVATIVES
FOR VPH SAMPLES

Matrix	Container	Preservation	Holding Times
Aqueous Samples	2-40ml VOC vials with Teflon-lined septa screw caps	Add 3 to 4 drops of 1:1 HCl; cool to 4°C	14 days
Soil/Sediment Samples	2 VOC vials with Teflon-lined septa screw caps. 40-ml vials: add 15g soil	1 ml methanol for every g soil; add before or at time of sampling, cool to 4°C	28 days

Sample Collection, Preservation and Handling for EPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

A Chain of Custody must accompany all samples that are submitted for analysis documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 2.

Aqueous Samples

1. Aqueous samples are collected in HCl preserved 1 liter amber glass bottles with Teflon-lined screw caps.
2. Aqueous samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

Soil Samples

1. Soil and sediment samples are collected in 4-oz amber glass jars with Teflon-lined screw caps.
2. Soil and sediment samples must be extracted within 7 days of collection, and analyzed within 40 days of extractions.

TABLE 2
HOLDING TIMES AND PRESERVATIVES
FOR EPH SAMPLES

Matrix	Container	Preservation	Holding Times
Aqueous Samples	1-Liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; cool to 4° C	Samples must be extracted within 14 days and extracts analyzed within 40 days
Soil/Sediment Samples	4-oz. (120mL) wide mouth amber glass jar with Teflon-lined screw cap.	Cool to 4° C	Samples must be extracted within 7 days and extracts analyzed within 40 days

APPENDIX 4
Collecting and Preserving VPH Soil Samples
Page 1 of 3

OPTION 1: In-Field Methanol Preservation Technique

PERFORMANCE STANDARD: Obtain undisturbed soil sample and preserved with methanol at a ratio of 1 mL methanol per 1 gram soil.

Step 1: Choose appropriate sampling container:

60 mL wide mouth packer bottle; or
60 mL straight sided wide mouth bottle; or
60 mL VOA vial; or
40 mL VOA vial

All sampling containers should have an open-top screw cap with Teflon-coated silicone rubber septa or equivalent.

Step 2: Label each container with a unique alpha/numerical designation. Obtain and record tare (empty) weight of each container to nearest 0.1 gram. *This information must be available to the laboratory performing the analyses.*

Step 3: Add 25 mLs of purge and trap grade methanol to 60 mL containers, or 15 mL to 40 mL containers. *It is essential that the methanol be purge and trap grade or equivalent quality.* Immediately cap the container. Make a mark on the 60 mL containers approximately 15 mL above the level of methanol, or a mark on the 40 mL container approximately 10 mL above the level of methanol. The objective is to obtain 25 grams of soil in the 60 mL containers, or 15 grams of soil in the 40 mL container, which is approximately 15 to 10 mL of soil volume, respectively, depending upon soil type and moisture content. Store at 4°C. *The use of methanol trip blank prepared in this manner is recommended.*

Step 4: In the field, carefully add soil to the sample container, until the level of methanol in the vial reaches the designated volumetric mark. For wet soil, add slightly beyond the mark. **IN NO CASE, HOWEVER, MAY THE LEVEL OF SOIL IN THE CONTAINER RISE ABOVE THE LEVEL OF METHANOL.** The use of a 10-30 mL disposal syringe with the end cut off is recommended to obtain an undisturbed soil sample from freshly exposed soils. In such cases, obtain and extrude the soil into sample container, avoiding splashing methanol out of the container.

Optional: use a field electronic balance to ensure addition of desired mass of soil (25 grams to 60 mL containers, 15 grams to 40 mL containers).

Step 5: Use a clean brush or paper towel to remove soil particles from the threads of the sample container and screw cap. Tightly apply and secure screw cap. Gently swirl sample to break up soil aggregate, if necessary, until soil is covered with methanol. **DO NOT SHAKE.** Duplicate sample obtained in this manner are recommended. A split-sample must also be obtained for a determination of soil moisture content. This sample must **NOT** be preserved in methanol. **HINT:** fill this container $\frac{1}{2}$ full, to allow screening of the sample headspace by the field investigator or the laboratory.

Step 6: Immediately place containers in cooler for storage in an upright position. Sample containers can be placed in separate zip-lock bags to protect containers in case of leakage during transport. Transport to analytical laboratory using appropriate chain of custody procedures and forms.

APPENDIX 4
Collecting and Preserving VPH Soil Samples
Page 2 of 3

OPTION 2: Use of a Sealed-Tube Sampling/Storage Device

PERFORMANCE STANDARD: Obtain undisturbed soil sample and immediately seal in air-tight container,, for shipment to laboratory and immersion in methanol within 48 hours.

Step 1: Obtain pre-cleaned and/or disposable samplers/containers that allow the collection and air-tight storage of at least 15 grams of soil.

Step 2: In the field, obtain an undisturbed sample from a freshly exposed soil. Immediately seal container and place in a cooler. Obtain a duplicate sample to enable the determination of soil moisture content (this does not need to be in a sealed sampler/container). Transport to analytical laboratory using appropriate chain of custody procedures and forms.

Step 3: Samples must be extruded and immersed in purge and trap (or equivalent) grade methanol at the laboratory within 48 hours of sampling, at a ration of 1 mL methanol to 1 gram soil. In no case, however, shall the level of soil in the laboratory container exceed the level of methanol (i.e., the soil must be completely immersed in methanol).

NOTE: Documentation MUST be provided/available on the ability of the sampler/container to provide an air-tight seal in a manner that results in no statistically significant loss of volatile hydrocarbons for at least 48 hours. To date, only one commercially available product, the En Core Sampler, has provided this level of demonstration.

OPTION 3: Use of Alternative Collection/Storage/Preservation Techniques

PERFORMANCE STANDARD: Obtain and store an undisturbed soil sample in a manner that ensures the chemical integrity of the sample by: (1) preventing the volatilization of petroleum hydrocarbons heavier than C5; and, (2) preventing the biological degradation of petroleum hydrocarbons.

NOTE: The onus is on the user of such techniques to demonstrate the validity of the procedures used, via reference to published literature and/or other pertinent data.

SAFETY

Methanol is a toxic and flammable liquid, and must be handled with appropriate care. Use in a well-vented area, and avoid inhaling methanol vapors. The use of protective gloves is recommended when handling or transferring methanol. Vials of methanol should always be stored in a cooler with ice at all times, away from sources of ignition such as extreme heat or open flames.

APPENDIX 4
Shipping Methanol Preserved Samples
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Shipping of Hazardous Materials

Methanol is considered a hazardous material by the US Department of Transportation (DOT) and the International Air Transport Association (IATA). Shipments of methanol between the field and the laboratory must conform to the rules established in Title 49 of the Code of Federal Regulations (49 CFR parts 171 to 179), and the most current edition of the IATA Dangerous Goods Regulations. Consult these documents or your shipping company for complete details.

Small Quantity Exemption

The volumes of methanol recommended in the VPH method fall under the small quantity exemption of 49 CFR section 173.4. To qualify for this exemption, all of the following must be met:

- the maximum volume of methanol in each sample container must not exceed 30 mL
- the sample container must not be full of methanol
- the sample container must be securely packed and cushioned in an upright position, and be surrounded by a sorbent material capable of absorbing spills from leaks or breakage of sample containers.
- the package weight must not exceed 64 pounds
- the volume of methanol per shipping container must not exceed 500 mL
- the packaging and shipping container must be strong enough to hold up to the intended use
- the shipper must mark the shipping container in accordance with shipping dangerous goods in acceptable quantities, and provide the statement:

"This package conforms to conditions and limitations specified in 49 CFR 173.4"

Shipping Papers

All shipments must be accompanied by shipping papers which include the following:

Proper Shipping Name:	Methyl Alcohol
Hazardous Class:	Flammable Liquid
Identification Number:	UN1230
Total Quantity:	(mL methanol/container x the number of containers)
Emergency Response Info:	Methanol MSDS attached
Emergency Response Phone:	Provide appropriate number
Shipping Exemption:	DOT-E 173.118, Limited Quantity

Labeling & Placarding

Labeling and placarding is not required for valid small quantity exemptions (per 173.118)

GROUNDWATER SAMPLE COLLECTION PROCEDURES USING BAILERS OR PUMPS

The following groundwater sampling protocols are based on standard methods found in ASTM Designation: D4448-85a, USEPA guidance documents (numerous references), and Massachusetts DEP "Standard References for Monitoring Wells" (WSC-310-91).

1. MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- health and safety equipment;
- map of well locations;
- well keys;
- interface probe;
- electronic water level indicator;
- PID or FID;
- pH, conductivity, and temperature meters; or a water quality monitoring system (pH, conductivity, temperature, ORP, and optional dissolved oxygen);
- field book;
- disposable gloves;
- stainless-steel, Teflon™ or PVC, bailers with Teflon check valves;
- dedicated polypropylene cord;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- cooler and cold source;
- decontamination equipment;
- polyethylene sheeting;
- polyethylene tubing and check valve;
- field filtering apparatus.

Pre-decontaminated bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site (See Decontamination Procedures).

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

2.0 WELL PURGING

- An interface probe or electronic water level indicator will be lowered to the air-water interface and the depth to water and depth of the well will be recorded. If the presence of a free phase product (light non-aqueous phase liquid - LNAPL) is suspected, an interface probe will be lowered to the product-water interface and the thickness of the product will be measured. Depth of the well will not be measured if LNAPL is present.
- If no free phase product is present in the well purging will begin:
 - Groundwater will be purged from the well using a decontaminated stainless-steel or PVC bottom-emptying bailer equipped with a Teflon™ check valve, or a non-contaminating water pump.
 - Groundwater collected during purging and sampling of groundwater monitoring wells will be discharged to the subsurface at the point of withdrawal in accordance with Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase product) this water will be drummed and disposed of according to applicable municipal, state, and federal regulations (See Disposal Procedures).
 - When using a pump, clean, dedicated polyethylene tubing will be used for each well. In appropriate situations, the polyethylene tubing can be stored in the well casing for use during future sampling events.
 - When using dedicated stainless-steel, PVC, or Teflon™ bailers to purge the wells, a separate pre-decontaminated bailer will be used for each well.
 - The bailer will be suspended with disposable/dedicated polypropylene cord. Care will be taken that the cord does not touch the ground during sampling and purging. The cord will be discarded upon completion of each well sampling event.
 - Non-dedicated bailers will be decontaminated in the field between each well sampling event according to Decontamination Procedures.
 - One of the following procedures will be used to determine if the purging is complete:
 - A. The efficiency of purging will be verified by measuring changes in the temperature, pH, and specific conductance (in-situ parameters) of well water during purging. The stabilization of pH, temperature, and conductivity readings for two consecutive measurements, indicates that "stagnant water" has been removed from the well and that aquifer formation water (groundwater) is now entering the well. Stabilization will be defined as the following: The pH measurements should be to within ± 0.1 pH unit, the temperature to within $\pm 1.0^{\circ}\text{C}$, and specific conductance to within ± 10 umhos/cm for two consecutive readings.

- B. An alternative method for determining if purging is complete may be used where the use of this method meets the assessment objectives. In this case, the well will be pumped or bailed until a specified volume of water has been removed from the well, commonly a minimum of 3 to 5 well bore volumes. In wells screened within low permeability formations, the well may go "dry" prior to the removal of 3 to 5 volumes. Purging is considered complete in this case. However, the complete draining of a well will be avoided if possible during the purging process because of the potential loss of volatiles.
- For complete purging of "stagnant water" (using either a pump or a bailer) the removal of well water will occur from just below the air-water interface in the well. In some situations, when using a pump, the pump intake may be lowered to remain just below the water surface as pumping is in progress. If the well screen is 20 feet or longer, groundwater will be pumped or bailed from the mid-point of the screen.
 - The temperature, conductivity, and pH of the first well volume will be recorded using individual pH, conductivity, and temperature meters or a water quality monitoring system. These parameters may be measured following the removal of each subsequent well volume. If specified, oxidation reduction potential will also be recorded.
 - The volume of purge water will be measured by pumping or bailing groundwater directly into a container of known volume.
 - When using a pump for purging, a water quality monitoring system can be connected to the pump discharge in order to monitor the in-situ parameters. In-situ parameters may be alternatively monitored in a beaker filled from the bailer or the pump discharge.
 - When bailing, care will be taken to assure that the bailer cord is held in the hand or placed upon plastic surrounding the well to prevent the potential of cross contamination from the ground surface to the well.
 - The volume of water purged from the well, the measurements of temperature, pH, and specific conductivity, and observations of color, odor, and turbidity will be recorded on a sampling log. An example of the ECS Groundwater Sampling Log is attached.
 - All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.

- When using dedicated bailers, the stainless-steel bailers will be rinsed with clean potable water following sample collection and placed in a plastic bag for transport to the company's facility where decontamination will take place (See Decontamination Procedures).

3.0 GROUNDWATER SAMPLING PROTOCOL

- Water samples for the analysis of volatile organic compounds (VOCs) (including volatile petroleum hydrocarbons) will be collected as soon as the well has sufficiently recovered from purging and within three hours of purging. Samples for the analysis for VOCs will be collected from the first volume of water collected from the top of the water column in the well.
- Groundwater samples collected for the analysis of VOCs will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2 . The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care to not to agitate the sample when transferring it from the bailer to the sample vial. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.
- Groundwater samples for analysis for PCBs, pesticides, total and extractable petroleum hydrocarbons, semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters, will be collected last. Assuming adequate recharge, all samples will be collected within 3 hours of purging or upon 90% recovery.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by using HDPE tubing with a decontaminated checkvalve and an in-line dedicated 0.45 micron filter. Care will be taken to pump the sample with very gentle pressure, in order to avoid any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter HDPE bottle pre-preserved with nitric acid to achieve a pH <2 .
- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency

- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the container will be rinsed with deionized water and dried with paper towels. Samples will be cooled to 4°C by placing them immediately in a chilled, thermally insulated container with a cold source;
- All sample containers will be labeled immediately upon collection with the following information: site; project number; well number; date; time of collection; testing parameters; initials of sampling personnel.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.
- All groundwater samples will be immediately placed in a chilled, thermally-insulated container and submitted as soon as possible to a Massachusetts-certified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.

GROUNDWATER SAMPLE COLLECTION PROCEDURES USING AN EARTHPROBE™

Groundwater samples will be collected by using a truck-mounted, hydraulically driven probe drive system (Earthprobe™) to drive a mill-slotted well point to a position below the water table. The groundwater samples will be collected by using a length of dedicated polyethylene tubing equipped with a check-valve, which when oscillated, will pump groundwater up into the tubing and to the surface or by attaching a vacuum pump to the polyethylene tubing to pump the water to the surface.

1.0 MATERIALS

The following materials will be available during groundwater sampling:

- health and safety equipment;
- YSI Water Quality Monitoring System (pH, conductivity, temperature, and ORP) or equivalent instruments;
- field book;
- disposable gloves;
- Earthprobe;
- Mill-slotted well point;
- Electronic water level indicator;
- dedicated 0.25-inch ID polyethylene tubing;
- stainless steel bottom check valves;
- Geoprobe™ AT-100 portable vacuum pump;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- cooler and cold source;
- decontamination equipment.

2.0 PROCEDURES

A decontaminated 36-inch, 1.0-inch outside diameter, alloy steel, temporary well point with a 24-inch 0.76-inch inside diameter 0.020 mill-slotted screen will be driven to a position below the water table at the depth of interest.

If soil sampling is performed prior to groundwater sample collecting, the soil sampler will be first removed from the borehole. A decontaminated 36-inch, 1.0-inch outside diameter, alloy steel, temporary well point with a 24-inch 0.76-inch inside diameter 0.020 mill-slotted screen will

be lowered into the hole if the borehole remains open or driven to a position below the water table at a depth of interest.

A decontaminated electronic water level indicator will be lowered through the probe rods to the air-water interface and the depth to water will be recorded.

A dedicated length of 0.25-inch inside diameter polypropylene tubing will be inserted through the probe rods to the depth of the well screen.

The temperature, conductivity, and pH of the first well volume will be recorded using the appropriate instruments. Protocols for these instruments are found in the procedures for field analysis. These parameters will be measured following the removal of each subsequent probe rod volume. The temporary well will be purged of at least three probe rod volumes if possible.

As soon as the well has sufficiently recovered from purging and within three hours of purging, groundwater samples will be collected directly from the end of the tubing according to groundwater sampling protocols.

2.10 - Groundwater Sampling Protocol using Polyethylene Tubing and Checkvalve.

A dedicated length of 0.25-inch inside diameter polypropylene tubing equipped with a stainless steel check valve will be inserted through the probe rods to the depth of the well screen. The tubing will be oscillated up and down in order to pump the groundwater to the surface.

2.20 - Groundwater Sampling Protocol using Polyethylene Tubing and a Portable Vacuum Pump

A dedicated length of 0.25-inch inside diameter polypropylene tubing will be inserted through the probe rods to the depth of the well screen. The tubing will be connected to a portable vacuum pump.

A portable vacuum pump (Geoprobe™ Model AT-100) will be used to pump the groundwater from below the water table to the surface.

The water sample will be collected directly from the tubing into a sample flask which is separated from the vacuum pump by a vacuum chamber and valve (see attached Figure). The collection of the groundwater sample in this manner, through the sample flask, allows for the separation of the air/water interface. This collection method is therefore acceptable for the collection of groundwater samples that are to be analyzed for volatile organic compounds.

Following purging of the temporary well, groundwater is pumped through the sample flask and the vacuum chamber through a valve, and into glass jar with a washer which is connected to the vacuum pump. The valve between the glass jar and the sample flask is then closed. Air is removed from the sample assembly by rotating the sample assembly. The valve is then opened so that all remaining air is drawn off.

Pumping continues until the glass jar is filled. The valve is then closed. The glass cap of the sample flask is then removed and the sample collected directly from the glass flask.

If there is silt in the sample, the flask should be allowed to sit until most of the silt settles to the bottom of the sample flask. The sample will then be decanted from the flask when collected.

GROUNDWATER SAMPLE COLLECTION PROCEDURES USING LOW FLOW SAMPLING METHODOLOGY

The following groundwater sampling protocols are based on the USEPA Region 1 Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells (July 30, 1996, Revision 2) (Region 1 Low Flow SOP #: GW 0001) with the following modifications.

1.0 MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- health and safety equipment;
- map of well locations;
- well construction data;
- field data from last sampling and/or gauging event;
- well keys;
- interface probe;
- electronic water level indicator;
- PID or FID;
- a multiprobe water quality monitoring system (pH, specific conductivity, temperature, ORP, and optional dissolved oxygen)-i.e. Geotech Multiprobe Sampling System™ or YSI Model 3560 Water Quality Monitoring System™
- field book;
- adjustable rate peristaltic pump;
- 3/16-inch inside diameter and 1/4-inch outside diameter polyethylene tubing;
- 1/4-inch inside diameter silicone tubing;
- cable ties;
- folding table;
- disposable gloves;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- cooler and ice;
- decontamination equipment;
- polyethylene sheeting;
- field filtering apparatus.

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

2.0 WELL PURGING

An electronic water level indicator will be lowered slowly to the air-water interface and the depth to water will be recorded. Care should be taken such that any particulates in the water column are not mobilized. Depth of the well should be based on previous sampling logs or measurements made after the collection of the groundwater sample. If the presence of a free phase product (light non-aqueous phase liquid - LNAPL) is suspected, an interface probe will be lowered to the product-water interface and the thickness of the product will be measured. If LNAPL is present, the well will not be sampled using the low flow sampling procedure.

- If no free phase product is present in the well purging will begin.
- Purging of each well prior to sampling is conducted using an adjustable rate peristaltic pump in line with a multiprobe water quality monitoring system. This instrument allows for the visual monitoring of five parameters (temperature, pH, specific conductivity, dissolved oxygen and Eh -- oxidation-reduction potential) simultaneously in real time. This system uses an adjustable rate peristaltic pump system to collect the purge water directly into a flow-through chamber assembly containing the parameter probes.
- A dedicated polyethylene tubing of 3/16-inch inside diameter and 1/4-inch outside diameter is tied flush with the tip of a water-level measurement indicator using a plastic cable tie and is lowered into the well casing until it is at the mid-point of the saturated screen length and at least 2 feet from the bottom of the well.
- A dedicated section, approximately one foot long, of 1/4-inch inside diameter silicone tubing is fit through the peristaltic pump. The silicone tubing connects the dedicated polyethylene tubing from the well to a small piece of polyethylene tubing (approximately 24-inch), which attaches to the flow-through chamber of the multiprobe water quality monitoring system.
- The pump is started at its lowest speed setting and slowly increased until the purge water is directly discharged into the chamber. Once the chamber is filled with purge water, the multiprobe meter displays are turned on and the initial stabilization parameter measurements should be recorded. The volume of purge water will be measured by pumping groundwater directly into a container of known volume.
- The pumping rate is adjusted until there is little or no water level drawdown. Any adjustments made should be recorded. During the initial pump start-up, the drawdown may exceed 0.3 feet as pump flow adjustments are made and the water level stabilizes. If the minimal drawdown possible exceeds 0.3 feet but remains stable, continue purging at the stabilized groundwater drawdown level.
- If drawdown exceeds 0.3 feet and does not stabilize, sampling should proceed.
- The water level inside the well casing is monitored every three to five minutes or approximately every 0.25 to 0.5 gallons during purging. Drawdown of less than 0.3 feet

during purging is desirable but not mandatory. The volume of water purged from the well, field measurement data (temperature, pH, specific conductance, ORP/Eh and dissolved oxygen if available) along with observations of color, odor and turbidity are recorded during the purging process every three to five minutes or as appropriate. An example of the ECS Low Flow Groundwater Sampling Log is attached.

- Purging is complete when stabilization of the groundwater parameters has been reached and the volume purged exceeds the stabilized groundwater drawdown volume plus the extraction tubing volume (approximately 0.014 gallons per 10 feet of tubing). Stabilization is achieved when three consecutive readings, taken at 3 to 5 minute intervals, are within the following limits: within +/- 0.5 degrees Celsius; within +/- 0.1 pH units; within +/- 10 $\mu\text{mhos/cm}$ (or $\mu\text{S/cm}$) specific conductance or within 3% if specific conductance is greater than 300 $\mu\text{mhos/cm}$ (or $\mu\text{S/cm}$); within +/- 10mV ORP/Eh.
- The amount of dissolved oxygen in the groundwater should be measured in each well after stabilization.
- A turbidity reading will be taken before the collection of the groundwater sample and the value will be recorded on the sampling log. Turbidity levels of less than 5 NTU are desirable but not mandatory.
- All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.
- Groundwater collected during purging and sampling of groundwater monitoring wells will be discharged to the subsurface at the point of withdrawal in accordance with Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase product) this water will be drummed and disposed of according to applicable municipal, state, and federal regulations (See Disposal Procedures).

3.0 GROUNDWATER SAMPLING PROTOCOL USING THE PERISTALTIC PUMP

- Once stabilization of the groundwater parameters occurs, the sampling of the groundwater from the well begins. Groundwater sampling may be performed with bailers according to ECS SOP 8.10 or using the peristaltic pump and dedicated polyethylene tubing. The following SOP describes groundwater sampling using peristaltic pump, the dedicated section of silicon tubing, and the dedicated section of polyethylene tubing in the well.
- Immediately prior to sampling, the polyethylene tube leading to the flow-through chamber of the multiprobe water quality monitoring system is disconnected so that the groundwater flows directly from the 1/4-inch silicone tubing into the sample vials.
- The location of the sampling point (or position of the end of the dedicated in-well tubing) will be the same location as it was during the purging process.
- If drawdown increases such that the recharge rate of the well is less than the slowest possible extraction rate, the well should be sampled as soon as the water level has recovered sufficiently to collect the appropriate volume needed for all required samples even though the parameters have not stabilized. The intake should not be lowered during the recovery period.
- Water samples for the analysis of volatile organic compounds (VOCs) and volatile petroleum hydrocarbons (VPH) will be collected first from the tubing in the water column in the well.
- Groundwater samples collected for the analysis of VOCs will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2. The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care not to agitate the sample which may mean slowing down the rate of the peristaltic pump. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.
- Groundwater samples for analysis for PCBs, pesticides, total petroleum hydrocarbons, extractable petroleum hydrocarbons (EPH), semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters will be collected last but immediately after collecting groundwater samples for analysis of VOCs.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by connecting a dedicated 0.45 micron filter in-line to the 1/4-inch silicone tubing. Care will be taken to adjust the pumping rate, in order to avoid any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter HDPE bottle pre-preserved with nitric acid to achieve a pH <2.

- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency
- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the container will be rinsed with deionized water and dried with paper towels. All sample containers will be labeled immediately upon collection with the following information: site; project number; well number; date; time of collection; testing parameters; initials of sampling personnel.
- All groundwater samples will be cooled to 4°C by placing them immediately in a chilled, thermally insulated container with ice and submitted as soon as possible to a Massachusetts-certified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.

WATER-LEVEL MEASUREMENT PROCEDURES

Depth to water-level measurements are taken to determine the elevation of the potentiometric surface. Water level measurements will be performed in each monitoring well prior to sampling. Because of fluctuating groundwater levels, all wells will be measured prior to sampling and within the same day, if possible. If the presence of NAPL is suspected, measurements will be made with an oil/water interface probe, otherwise, an electronic water level indicator will be used. These instruments are accurate to 0.01 feet. The following procedures are based on Massachusetts DEP guidelines (DEP, 1991) and ASTM Designations D 5092 - 90 and D 4750 - 87.

- The measuring instrument will be decontaminated prior to use and between wells according to the standard decontamination procedures.
- Measurements will progress from the least contaminated wells to the most contaminated wells.
- The well casing will be opened and the headspace will be monitored for total organic vapors using a PID or FID. If a reading of 5 ppm or greater is detected, the well will be allowed to vent for 5 to 10 minutes. If after this time the reading is 5 ppm or greater, a determination regarding the level of personal protective equipment needed will be made before sampling continues. If specified, PID or FID readings for well casing headspace will be recorded for each well.
- An interface probe will be lowered to the air-water interface and the depth to water will be recorded. The interface probe will be lowered to the bottom of the well to measure the depth of the well and in wells where chlorinated hydrocarbons were detected to determine if dense non-aqueous phase liquid (DNAPL) is present. If the presence of a free phase product (LNAPL) is indicated, the probe will be lowered to the product-water interface and the thickness of the product will be recorded but the depth of the well will not be measured.
- One water-level measurement will be made from a reference point on the PVC well riser pipe and another from the top of the protective well casing at the surface elevation. The reference point on the PVC will be a V-notch cut into the top edge of the riser pipe at the highest point. This will be the surveyed point on the riser. The reference point on the well riser is preferred for determining depth to water-level due to its stability. The protective well casing is more susceptible to movement through settling, frost heaving, or displacement by impact.

- The volume of standing water in the well (static volume) will be calculated and used during well purging prior to sampling.
- The total depth of the well, depth to product, depth to water, standing water height, and static volume will be recorded on the groundwater sampling log (attached).

DECONTAMINATION

Decontamination will be performed in order to: minimize the spread of contaminants on the Site and from one sampling location to another; reduce the potential exposure of field personnel to contaminants; and to ensure good data quality and reliability. Decontamination of all field analytical testing and sampling equipment will be performed according to the following procedures. These procedures are based on ASTM Designation D 5088-90, USEPA CERCLA QAPP Review Guidance, 1987, and Massachusetts DEP Standard Reference for Monitoring Wells, 1991.

Equipment cleaning procedures include pre-field, field, and post-field decontamination. Non-disposable equipment will be decontaminated after completing each sampling event. In cases of gross contamination (free phase product), rinse water will be contained for proper disposal according to municipal, state, and federal regulations. Decontamination procedures will be monitored through sampling and analysis when quality assurance/quality control checks are necessary.

Equipment will be dedicated to each sampling point and decontamination will be performed at the off-site facility as much as possible.

Decontaminated equipment will be rested on polyethylene sheeting at each sampling point.

Samplers will use new disposable gloves at each sampling point.

Potable water from the public water supply will be used for control rinse water.

A certified laboratory supply of deionized water will be used for decontamination of field testing and sampling equipment and for the collection of rinsate blanks. Deionized water will be stored in Nalgene, glass, or Teflon containers. The storage area containing the deionized water will be separated from the storage area for solvents.

Equipment rinsate blanks will be collected when a quality control check of the decontamination procedure is necessary. This check will not be performed if dedicated equipment is used. One blank will be collected at least once during a sampling event for each different piece of sampling equipment used. Rinsate blanks will be prepared by pouring deionized water over the decontaminated piece of equipment and collecting it in the sample container. The equipment rinsate blank will be analyzed for the same analytes as the samples that have been collected with that piece of equipment.

1.0 MATERIALS

- health and safety equipment;
- laboratory-supplied deionized water;
- phosphate-free detergent (Alconox, Liquinox);
- potable water (municipal water source);
- methanol;
- Hexane;
- Acetone;
- nitric acid rinse solution;
- wash basins;
- inert brushes;
- polyethylene sheeting;
- large heavy duty garbage bags;
- spray bottles;
- zip-lock bags;
- paper towels/Handiwipes;
- disposable gloves.

2.0 DECONTAMINATION PROCEDURES

- Stainless steel bailers will be disassembled, soaked in hot potable water and scrubbed with a brush in "Alconox" detergent and potable water, and rinsed with clean potable water at the company's facility. Bailers will be allowed to air dry in a vertical position in a contaminant-free environment.
- Prior to the sampling event, bailers used for the collection of samples which will undergo analysis for total petroleum hydrocarbons and volatile organic compounds will be rinsed with hot potable water followed by a 10% methanol solution of pesticide grade methanol and deionized water, followed by a final rinse with deionized water. The volume of deionized water will be at least five times the volume of the methanol. Bailers used for the collection of samples which will undergo analysis for semi-volatile organic compounds, PCBs, and pesticides will be rinsed with a technical grade acetone followed by a pesticide grade hexane, and a final deionized water rinse as above. Bailers used for the collection of groundwater samples which will undergo analysis for metals will be rinsed with 10 per cent nitric acid solution prepared from reagent grade nitric acid and deionized water followed by a potable water rinse, and a final deionized water rinse.
- Bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site.

- Following sample collection, the stainless-steel bailers will be rinsed with clean potable water and placed in a plastic bag for transport to the company's facility where decontamination will take place.
- Soil and sediment sampling equipment (stainless steel sampling scoop, tool, and bowl, split-spoon and macro-core sampler, knife) will be decontaminated in the field after each use.
- Soil and sediment sampling equipment will be decontaminated as follows: scrubbed with inert brushes in a bucket containing phosphate-free detergent and potable water; rinsed with potable water; rinsed with pesticide grade methanol; and finally rinsed with deionized water. The final potable water and deionized water rinse volumes will equal 5 times the volume of the methanol rinse. The equipment will be allowed to air dry and will be stored in a clean environment until reused.
- Non-dedicated field equipment used for the collection of samples to be analyzed for metals and filtering apparatus will be cleaned prior to each use by using a phosphate-free detergent solution, a potable water rinse, followed by a 10 percent nitric acid rinse solution prepared from reagent grade nitric acid and deionized water, a potable water rinse, and a final rinse with deionized water. Used filters will be properly disposed of.
- The YSI Water Quality Monitoring System™, Geotech Multi Parameter™ meter, interface probe, down-hole slug test equipment, QED Water Wizard well development equipment, and other measuring instruments will be decontaminated between uses by rinsing with Alconox or Liquinox, followed by potable water and deionized water rinses. A methanol rinse will be utilized prior to the deionized water rinse in the event of gross contamination such as contact with free-phase product.
- The drill rig and earthprobe and all drilling equipment and associated tools, including but not limited to augers, drill casing, drill rods, sampling equipment, and wrenches, will be steam cleaned prior to beginning the drilling on the Site. This cleaning will consist of using a high pressure detergent steam cleaning equipment, followed by a nanograde methanol swabbing if gross contamination was present. This will be followed by a controlled water rinse. Any down-hole equipment (auger flights, rods, sampling equipment, etc.) coming in contact with gross contamination (i.e. free phase product) will be steam-cleaned between uses. Otherwise equipment will be scrubbed manually with potable water and Alconox as needed to remove soil between uses.
- Sampling equipment and probes will be decontaminated in an area covered by polyethylene sheeting adjacent to the sampling location.
- In cases of gross contamination (i.e. free phase product) rinse water will be collected for proper disposal according to municipal, state or federal regulations. Contaminated solids (disposable gloves, clothing, polyethylene tubing and sheeting, etc.) will be collected and characterized for proper disposal.
- Decontamination procedures will be fully documented in the field notebook. The following information should be recorded: Site location, date, time and weather; sample location

where equipment used; location where decontamination was performed; field personnel performing the decontamination; decontamination procedures; disposal of rinse water if necessary; samples collected for QA/QC and analytical results.

- Health and safety procedures associated with decontamination are found in the Health and Safety Plan.

SAMPLE CUSTODY PROCEDURES

- Sample custody procedures will be followed in order to create an accurate written record. This record can be used to trace the possession and handling of all samples from collection, through all transfers of custody until the samples are delivered to the analytical laboratory. Custody for samples will be maintained by field personnel collecting the samples. The following procedures are based on ASTM Designation D 4840-88, standard methods found in DEP (1991), and USPEA (1987) guidance documents.
- A self-adhesive waterproof sample label will be affixed to each sample container before sample collection. A waterproof pen will be used to record the following information on the label:
 - Project Number
 - Sample ID Number
 - Sample Location
 - Sample Matrix
 - Date and Time of Sample Collection
 - Designation as Grab or Composite Sample
 - Parameters to be Tested
 - Preservative
 - Initials of Sampler
- All sample containers will be supplied by a state-certified laboratory. Commercially purchased sample containers will be pre-cleaned and quality controlled according to EPA recommended washing procedures and specifications (Level I and/or Level A according to the vendor's specifications). Custody of the sample containers will be maintained by the Project Manager and will be relinquished to the field personnel collecting the samples after verification that the proper containers have been assigned for the proper sampling task.
- Chemical preservatives will be added to the sample containers by the state-certified laboratory providing the containers. Tables 1 and 2 indicate the type of preservation which will be used.
- Chain-of-custody records will be filled out by the sampler using information from the sample labels. The chain-of-custody will include the dates and times of collection and receipt. The chain-of-custody will document any tampering that may have occurred; if there are no such comments then no tampering was observed. An example of the chain of custody (provided by Spectrum Analytical, Inc. of Agawam, Massachusetts) is included.

- One chain-of-custody record will be used for each packaged lot of samples. More than one chain-of-custody may be used for one packaged lot.
- Samples will be stored in a thermally insulated container with ice. EPA protocols do not allow the use of ice packs or ice substitutes because they are unable to reach or maintain a cold enough temperature. The samples will be delivered to a state-certified laboratory by a member of the sampling team within 24 hours of sample collection. The field chain-of-custody records completed at the time of sample collection will be placed inside the cooler for transport to the laboratory. These forms will be sealed in a zip-lock type plastic bag to protect them against moisture. Each cooler will contain sufficient ice to insure that a 4°C temperature is maintained, and will be packed in a manner to prevent damage to the sample containers.
- The chain-of-custody form will be signed by the relinquishing party and the receiving party. The reason for transfer will be indicated each time the sample custody changes. Internal laboratory records will document sample custody until its final disposition.

APPENDIX C

Certifications of Laboratory Analysis



SPECTRUM ANALYTICAL, INC.

Featuring

HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138

Rhode Island # 98 Maine # MA138

Florida # E87600 / 87562

New Hampshire # 2538

Connecticut # PH-0777

New York # 11393

ECS, Inc.

588 Silver Street

Agawam, MA 01001

Attn: Chris Parent

Client Project Number: 13997



Thursday, April 26, 2001

Report Status:

- ☒ Final Report
- ☐ Re-issued Report
- ☐ Revised Report

Location: Wayside Ave-W. Springfield

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AC42575	S-1	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes % Solids
AC42576	S-3	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes % Solids
AC42577	S-13	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes % Solids
AC42578	S-17	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: Wayside Ave-W. Springfield

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AC42578	S-17	% Solids
AC42579	S-20	Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes
AC42580	S-23	% Solids Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes
AC42581	S-24	% Solids Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes
AC42582	S-25	% Solids Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes
AC42583	S-27	% Solids Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes % Solids



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: Wayside Ave-W. Springfield

Laboratory ID

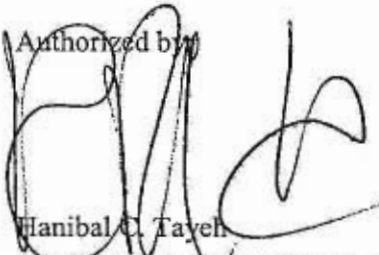
Client Sample ID

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method and meet the requirements of NELAC including any data obtained from a subcontract laboratory. Please note that all solid matrix sample results are calculated on a dry weight basis unless otherwise specified.

This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Authorized by


Hanibal C. Tayeh
President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: Wayside Ave-W. Springfield
 Client: ECS
 Lab ID No: AC42575
 Client Id: S-1

Client Project No: 13997
 Submittal Date: 4/25/01
 Collection Date: 4/24/01
 Matrix: Soil

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
<i>VPH Aliphatics/Aromatics</i>						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.810	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.810	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
<i>VPH Target Analytes</i>						
Benzene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	110	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	112	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	110	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
<i>EPH Aliphatics/Aromatics</i>						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
<i>EPH Target PAH Analytes</i>						
Naphthalene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
2-Methylnaphthalene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Dibenzo (a,a) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	72	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	52	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	72	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	72	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	93.8	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	1.22	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.405	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.405	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	1.22	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.405	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	160	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	92	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	91	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Anthracene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	67	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	59	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	88	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	81	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	77.5	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.810	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.810	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	110	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	97	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	95	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	66	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	54	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	73	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	72	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	94.9	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
<i>PH Aliphatics/Aromatics</i>						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	1.27	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.425	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.425	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	1.27	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.425	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
<i>VPH Target Analytes</i>						
Benzene	Below det lim	ug/Kg	85	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	85	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	85	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	170	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	85	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	85	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	85	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	91	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	90	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
<i>EPH Aliphatics/Aromatics</i>						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
<i>EPH Target PAH Analytes</i>						
Naphthalene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	54	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	40	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	78	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	72	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	75.8	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.960	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.320	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.320	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.960	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.320	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	130	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	91	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	89	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
<i>EPH Target PAH Analytes</i>						
Anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	97	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	55	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	97	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	89	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	81.1	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
<i>VPH Aliphatics/Aromatics</i>						
C5-C8 Aliphatic Hydrocarbons	2.7	mg/Kg	0.765	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	3.8	mg/Kg	0.255	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	3.9	mg/Kg	0.255	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	2.7	mg/Kg	0.765	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	7.7	mg/Kg	0.255	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	100	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	100	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	96	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
<i>EPH Aliphatics/Aromatics</i>						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Anthracene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Fluoranthene	250	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Pyrene	220	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	106	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	66	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	102	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	89	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	88.6	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
TPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.690	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.230	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.230	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.690	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.230	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	46	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	46	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	46	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	92	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	46	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	46	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	46	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	121	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	121	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
<i>EPH Target PAH Analytes</i>						
Anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	71	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	62	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	98	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	83	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	93.4	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
PH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	13	mg/Kg	4.14	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	70	mg/Kg	1.38	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	103	mg/Kg	1.38	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	25	mg/Kg	4.14	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	173	mg/Kg	1.38	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	250	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	2,200	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	10,200	ug/Kg	550	4/25/01	RLJ	MA VPH 97-12
o-Xylene	1,400	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Naphthalene	3,600	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	98	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	117	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	250	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	200	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	260	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	272	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	291	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	8,700	ug/Kg	210	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	9,600	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Phenanthrene	250	ug/Kg	210	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Anthracene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Fluoranthene	330	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Pyrene	330	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Dibenzo (a,i) anthracene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	68	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	62	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	92	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	80	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	86.2	%		4/25/01	RTW	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01		SW846 5035
Volatile Organic Compounds						
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	1.05	4/25/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.350	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.350	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	1.05	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.350	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	140	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	107	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	106	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
<i>EPH Target PAH Analytes</i>						
Anthracene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Dibenzo (a,i) anthracene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	68	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	57	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	86	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	74	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	79.3	%		4/25/01	RTW	SM2540 B Mod

Parameter Results Units PQL Start Date Analyst Method

The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

Matrix	<input type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking
Aqueous Preservative	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> pH ≤ 2 <input type="checkbox"/> pH > 2 <input type="checkbox"/> pH adjusted to ≤ 2 in lab Comment:
Temperature	<input checked="" type="checkbox"/> Received on ice <input type="checkbox"/> Received cold <input type="checkbox"/> Received ambient <input checked="" type="checkbox"/> Recorded temperature: 1-7°C

The following outlines the condition of all VPH samples contained within this report upon laboratory receipt.

Matrix	<input type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking
Sample Preservative	Aqueous: <input checked="" type="checkbox"/> N/A <input type="checkbox"/> pH ≤ 2 <input type="checkbox"/> pH > 2 Comment:
	Soil or Sediment: <input type="checkbox"/> N/A <input type="checkbox"/> Samples NOT received in Methanol or air-tight container
	<input checked="" type="checkbox"/> Samples received in Methanol covering soil <input type="checkbox"/> not covering soil
	<input type="checkbox"/> Sample received in air-tight container:
Temperature	<input checked="" type="checkbox"/> Received on ice <input type="checkbox"/> Received cold <input type="checkbox"/> Received ambient <input checked="" type="checkbox"/> Recorded temperature: 1-7°C

Were all QA/QC procedures followed as required by the VPH method? Yes ☒ No ☐

Were any significant modifications made to the VPH method, as specified in Section 11.3? No * see below

Were all QA/QC procedures followed as required by the EPH method? Yes ☐ No ☒

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ** see below

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes ☒ No ☐

* Yes, if PID and FID surrogate recoveries are listed as n/a, then that sample was run via GCMS using all QC criteria specified in the method.

** Sample(s) was run via GCMS using all QC criteria specified in the method.

I attest that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Reviewed by:

Validated by:

Quality Service/Quality Assurance Depts.

President/Laboratory Director

4/26/01



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Laboratory Report Supplement

References

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19 th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

Acronyms & Abbreviations

AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	SW	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC / MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



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CHAIN OF CUSTODY RECORD

Special Handling:

- ☐ Standard TAT - 7 to 10 business days
- ☒ Rush TAT - Date Needed 4/20/01
- All TATs subject to laboratory approval.
- Min. 24-hour notification needed for rushes.
- All samples are disposed of after 60 days unless otherwise instructed.

Page 1 of 2

Report To: ECS Invoice To: ECS Project No.: 13997

Project Mgr.: CTP P.O. No.: 13997 RQN: 70

Site Name: Wing Side Ave.

Location: West Springfield State: MA

Sampler(s): 70

1=Na₂SO₃ 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=Ascorbic Acid

7=CH₃OH 8=NaHSO₄ 9= 10=

DW=Drinking Water GW=Groundwater WW=Wastewater

O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air

X1= X2= X3=

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses	Notes
AC 42575	S-1	4/20/01		G	So	7	2				HHB	
AC 42576	S-1					7	2	1			X	
AC 42577	S-3					7	2	1			X	
AC 42578	S-3					7	2	1			X	
AC 42579	S-13					7	2	1			X	
AC 42580	S-13					7	2	1			X	
AC 42581	S-17					7	2	1			X	
AC 42582	S-17					7	2	1			X	
AC 42583	S-20					7	2	1			X	
AC 42584	S-20					7	2	1			X	

Relinquished by: Tabley Received by: RL Date: 4/25 Time: 8:30

Fax results when available to ()

E-mail results when available to

Condition upon Receipt: ☐ Iced ☐ Ambient ☒ 16 °C

mm



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Featuring
HARBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 2 of 2

Special Handling:

- ☐ Standard TAT - 7 to 10 business days
- ☒ Rush TAT - Date Needed: 4/26/01
- All TATs subject to laboratory approval
- Min. 24-hour notification needed for rushes.
- All samples are disposed of after 60 days unless otherwise instructed.

Report To: <u>ECS</u>	Invoice To: <u>ECS</u>	Project No.: <u>13997</u>
		Site Name: <u>Windside Ave</u>
		Location: <u>W. Springfield</u> State: <u>MA</u>
Project Mgr.: <u>CJP</u>	P.O. No.: <u>13997</u> RQN: <u>TP</u>	Sampler(s): <u>TP</u>

1=Na₂S₂O₃ 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=Ascorbic Acid
7=CH₃OH 8=NaHSO₄ 9= 10=

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1= X2= X3=

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Containers	Analyses	Notes
AC42580	S-23	4/24/01		G	S	7	2						
AC	S-23					1							
AC42581	S-24					7	2						
AC	S-24					1							
AC42582	S-25					7	2						
AC	S-25					1							
AC42583	S-27					7	2						
AC	S-27					1							
AC													
AC													

Relinquished by: <u>Todd Dwyer</u>		Received by: <u>John</u>	Date: <u>4/25</u>	Time: <u>8:30</u>
Fax results when available to ()				
E-mail results when available to				
Condition upon Receipt: <input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input checked="" type="checkbox"/> 16 °C				



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HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138

Rhode Island # 98 Maine # MA138

Florida # E87600 / 87562

New Hampshire # 2538

Connecticut # PH-0777

New York # 11393

ECS, Inc.
588 Silver Street
Agawam, MA 01001

Attn: Chris Parent

Client Project Number: 13997

Monday, April 30, 2001

Report Status:

- ☒ Final Report
☐ Re-issued Report
☐ Revised Report



Location: Wayside Ave. - W. Spfld., MA

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AC42819	S 31	% Solids VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes
AC42820	S 32	% Solids VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes
AC42821	S 37	% Solids VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes Ultrasonic Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes
AC42822	S 40	% Solids VOC Extraction (solid) VPH Aliphatics/Aromatics VPH Target Analytes Ultrasonic Extraction EPH Aliphatics/Aromatics



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HANIBAL TECHNOLOGY

Client Project Number: 13997

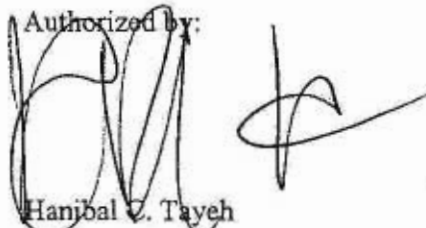
Location: Wayside Ave. - W. Spfld., MA

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AC42822	S 40	EPH Target PAH Analytes VOCs by GC/MS
AC42823	Trip 1	VPH Aliphatics/Aromatics VPH Target Analytes

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method and meet the requirements of NELAC including any data obtained from a subcontract laboratory. Please note that all solid matrix sample results are calculated on a dry weight basis unless otherwise specified.

This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Authorized by:



Hanibal C. Tayeh
President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: Wayside Ave. - W. Spfld., MA

Client: ECS

Lab ID No: AC42819

Client Id: S 31

Client Project No: 13997

Submittal Date: 4/25/01

Collection Date: 4/25/01

Matrix: Soil

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
<i>VPH Aliphatics/Aromatics</i>						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.675	4/30/01	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.225	4/30/01	GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.225	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.675	4/30/01	GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.225	4/30/01	GW	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/30/01	GW	MA VPH 97-12
<i>VPH Target Analytes</i>						
Benzene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
Toluene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	90	4/30/01	GW	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	87	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	86	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/26/01	RT	SW846 3550B
Petroleum Hydrocarbon Analysis						
<i>EPH Aliphatics/Aromatics</i>						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/27/01	MSL	MA EPH 98-1
<i>EPH Target PAH Analytes</i>						
Naphthalene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Acenaphthylene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	57	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	66	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	75	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	88	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
% Solids	92.5	%		4/25/01	RT	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
PH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	5.9	mg/Kg	3.49	4/30/01	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	14	mg/Kg	1.16	4/30/01	GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	18	mg/Kg	1.16	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	7.7	mg/Kg	3.49	4/30/01	GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	32	mg/Kg	1.16	4/30/01	GW	MA VPH 97-12
Carbon Chain Dilution Factor	200	mg/Kg	0.	4/30/01	GW	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Toluene	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
m,p-Xylenes	1,800	ug/Kg	470	4/30/01	GW	MA VPH 97-12
o-Xylene	880	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Naphthalene	820	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	78	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	90	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	200	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/26/01	RT	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	81	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	32	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	104	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	107	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/27/01	MSL	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	720	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
2-Methylnaphthalene	2,200	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Phenanthrene	280	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	76	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	74	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	106	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	104	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
% Solids	80.4	%		4/25/01	RT	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
<i>VPH Aliphatics/Aromatics</i>						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.915	4/30/01	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.305	4/30/01	GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.305	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.915	4/30/01	GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.305	4/30/01	GW	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/30/01	GW	MA VPH 97-12
<i>VPH Target Analytes</i>						
Benzene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-12
Toluene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	120	4/30/01	GW	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	84	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	86	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/26/01	RT	SW846 3550B
Petroleum Hydrocarbon Analysis						
<i>EPH Aliphatics/Aromatics</i>						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/27/01	MSL	MA EPH 98-1
<i>EPH Target PAH Analytes</i>						
Naphthalene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	82	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	58	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	94	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	95	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
% Solids	84.4	%		4/25/01	RT	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extracion (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
<i>VOCs by GC/MS</i>						
Acetone	Below det lim	ug/Kg	7000	4/30/01	GW	SW846 8260B
Acrylonitrile	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Benzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromochloromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromodichloromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromoform	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromomethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
2-Butanone (MEK)	Below det lim	ug/Kg	3500	4/30/01	GW	SW846 8260B
n-Butylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
sec-Butylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
tert-Butylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Carbon disulfide	Below det lim	ug/Kg	350	4/30/01	GW	SW846 8260B
Carbon tetrachloride	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Chlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Chloroethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
Chloroform	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Chloromethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
2-Chlorotoluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Chlorotoluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
Dibromochloromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dibromoethane (EDB)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Dibromomethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,3-Dichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,4-Dichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Dichlorodifluoromethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
1,1-Dichloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dichloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1-Dichloroethene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
cis-1,2-Dichloroethene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
trans-1,2-Dichloroethene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dichloropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,3-Dichloropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
2,2-Dichloropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1-Dichloropropene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOCs by GC/MS						
cis-1,3-Dichloropropene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
trans-1,3-Dichloropropene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Ethylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Hexachlorobutadiene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
2-Hexanone (MBK)	Below det lim	ug/Kg	7000	4/30/01	GW	SW846 8260B
Isopropylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Isopropyltoluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Methyl-2-pentanone (MIBK)	Below det lim	ug/Kg	1400	4/30/01	GW	SW846 8260B
Methylene chloride	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Naphthalene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
n-Propylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Styrene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,1,2-Tetrachloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,2,2-Tetrachloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Tetrachloroethene (PCE)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Toluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,3-Trichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,4-Trichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,1-Trichloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,2-Trichloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Trichloroethene (TCE)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Trichlorofluoromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,3-Trichloropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,4-Trimethylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,3,5-Trimethylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Vinyl chloride	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
m,p-Xylenes	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
o-Xylene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Bromofluorobenzene (%SR)	92	ug/Kg	0.000	4/30/01	GW	SW846 8260B
1,4-Difluorobenzene (%SR)	99	ug/Kg	0.000	4/30/01	GW	SW846 8260B
Chlorobenzene-d5 (%SR)	97	ug/Kg	0.000	4/30/01	GW	SW846 8260B
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	1.05	4/30/01	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.350	4/30/01	GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.350	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	1.05	4/30/01	GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.350	4/30/01	GW	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/30/01	GW	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VPH Target Analytes						
Toluene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	140	4/30/01	GW	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	87	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	91	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/26/01	RT	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/27/01	MSL	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	57	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	59	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1

Lab ID No: AC42822
Client Id: S 40

Collection Date: 4/25/01
Matrix: Soil

Parameter	Results	Units	PQL	Start Date	Analyst	Method
<i>EPH Target PAH Analytes</i>						
2-Bromonaphthalene Fractionation (%SR)	101	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	98	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
% Solids	80.5	%		4/25/01	RT	SM2540 B Mod

Parameter	Results	Units	PQL	Start Date	Analyst	Method
Volatile Organic Compounds						
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/L	0.750	4/30/01	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/L	0.250	4/30/01	GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/L	0.250	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/L	0.750	4/30/01	GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/L	0.250	4/30/01	GW	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/L	0.	4/30/01	GW	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/L	50	4/30/01	GW	MA VPH 97-12
Toluene	Below det lim	ug/L	50	4/30/01	GW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/L	50	4/30/01	GW	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/L	100	4/30/01	GW	MA VPH 97-12
o-Xylene	Below det lim	ug/L	50	4/30/01	GW	MA VPH 97-12
Naphthalene	Below det lim	ug/L	50	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	50	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/L	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/L	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	86	ug/L	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	90	ug/L	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/L	0.	4/30/01	GW	MA VPH 97-12

Parameter Results Units PQL Start Date Analyst Method

The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

Matrix	<input type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking
Aqueous Preservative	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> pH \leq 2 <input type="checkbox"/> pH $>$ 2 <input type="checkbox"/> pH adjusted to \leq 2 in lab Comment:
Temperature	<input checked="" type="checkbox"/> Received on ice <input type="checkbox"/> Received cold <input type="checkbox"/> Received ambient <input checked="" type="checkbox"/> Recorded temperature: 3°C

The following outlines the condition of all VPH samples contained within this report upon laboratory receipt.

Matrix	<input type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking
Sample Preservative	Aqueous <input checked="" type="checkbox"/> N/A <input type="checkbox"/> pH \leq 2 <input type="checkbox"/> pH $>$ 2 Comment:
	<input type="checkbox"/> N/A <input type="checkbox"/> Samples NOT received in Methanol or air-tight container
	<input checked="" type="checkbox"/> Samples received in Methanol covering soil <input type="checkbox"/> not covering soil
	<input type="checkbox"/> Sample received in air-tight container:
Temperature	<input checked="" type="checkbox"/> Received on ice <input type="checkbox"/> Received cold <input type="checkbox"/> Received ambient <input checked="" type="checkbox"/> Recorded temperature: 3°C

ml Methanol/g soil
☒ 1:1 +/- 25%
☒ Other: 1:2
AC42823

Were all QA/QC procedures followed as required by the VPH method? Yes ☒ No ☐

Were any significant modifications made to the VPH method, as specified in Section 11.3? No * see below

Were all QA/QC procedures followed as required by the EPH method? Yes ☒ No ☐

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ** see below

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes ☒ No ☐

* Yes, if PID and FID surrogate recoveries are listed as n/a, then that sample was run via GCMS using all QC criteria specified in the method.

** Sample(s) was run via GCMS using all QC criteria specified in the method.

I attest that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Reviewed by:

Validated by:

Quality Service/Quality Assurance Depts.

President/Laboratory Director

4/30/01



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Laboratory Report Supplement

References

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19 th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

Acronyms & Abbreviations

AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	SW	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC / MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



SPECTRUM ANALYTICAL, INC.

CHAIN OF CUSTODY RECORD

Special Handling:

- ☐ Standard TAT - 7 to 10 business days
☒ Rush TAT - Date Needed: 4/25/01
All TATs are subject to laboratory approval. NOON
Min. 24-hour notification is needed for rushes.
All samples are disposed of after 60 days unless otherwise instructed.

0425 1038 EC

Page 1 of 2Report To: ECsInvoice To: ECsProject No.: 13997Site Name: WASIDE AVELocation: W Springfield State: MAProject Mgr.: CPP.O. No.: 13997 RQN: Sampler(s): TD1=Na₂S₂O₃ 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=Ascorbic Acid
8=CH₃OH 9=NaHSO₄ 10= 11=

Containers:

Analyses:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
SW=Surface Water SO=Soil SL=Sludge O=Oil A=Air
X1= X2= X3=

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Containers:	Analyses:	Notes:
AB 42819	531	4/25		G	SO	8	2	1				UPH	
AB 42820	532	4/25		G	SO	8	2	1				UPH	
AB 42821	537	4/25		G	SO	8	2	1				UPH	
AB 42822	540	4/25		G	SO	8	2	1				UPH	
AB 42823	74191												
AB													
AB													
AB													
AB													
AB													

Additional Instructions: Relinquished By: Todd BlyReceived By: Joe KozakDate: 4-25-01Time: 3:06 PMFax results when available to () 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301Fax: 301



SPECTRUM ANALYTICAL, INC.

CHAIN OF CUSTODY RECORD

Special Handling:

- ☐ Standard TAT - 7 to 10 business days
☐ Rush TAT - Date Needed: _____
All TATs are subject to laboratory approval.
Min. 24-hour notification is needed for rushes.
All samples are disposed of after 60 days
unless otherwise instructed.

Page 2 of 2Report To: ECsInvoice To: ECsProject No.: 13997Site Name: W. Springfield AveLocation: W. Springfield State: MASampler(s): TDProject Mgr.: CRPP.O. No.: 13997 R.O.N.: _____1=Na₂S₂O₃ 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=Ascorbic Acid
8=CH₃OH 9=NaHSO₄ 10=DW=Drinking Water GW=Groundwater WW=Wastewater
SW=Surface Water SO=Soil SL=Sludge O=Oil A=Air

X1= X2= X3=

G=Grab C=Composite

Lab Id: Sample Id: Date: Time:

Type Matrix

Preservative

of VOA Vials

of Amber Glass

of Clear Glass

of Plastic

Containers:

Analyses:

Notes:

AB 42824 S33 4/25

G 50

8

2

1

AB 42825 S34 4/25

G 50

8

2

1

AB 42826 S35 4/25

G 50

8

2

1

AB 42827 S36 4/25

G 50

8

2

1

AB 42828 S38 4/25

G 50

8

2

1

AB 42829 S35 4/25

G 50

8

2

1

AB 42830 T492

G 50

8

2

1

AB

AB

AB

Additional Instructions: FieldRelinquished By: Todd DReceived By: Jack DDate: 4-25-01Time: 3:06 PM☐ Fax results when available to () 3 pm

0425 1838 KC



SPECTRUM ANALYTICAL, INC.

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HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138

Rhode Island # 98 Maine # MA138

Florida # E87600 / 87562

New Hampshire # 2538

Connecticut # PH-0777

New York # 11393

ECS, Inc.
588 Silver Street
Agawam, MA 01001

Attn: Chris Parent

Client Project Number: 13997

Wednesday, May 16, 2001

Report Status:

- ☒ Final Report
☐ Re-issued Report
☐ Revised Report



Location: 115 Wayside Ave-W, Spfld, MA

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analyses Requested</u>
AC45715	MW-3	Separatory Funnel Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VPH Aliphatics/Aromatics VPH Target Analytes VOCs by GC/MS
AC45716	MW-2	Separatory Funnel Extraction EPH Aliphatics/Aromatics EPH Target PAH Analytes VPH Aliphatics/Aromatics VPH Target Analytes VOCs by GC/MS
AC45717	Trip	VPH Aliphatics/Aromatics VPH Target Analytes VOCs by GC/MS



SPECTRUM ANALYTICAL, INC.

Featuring
HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: 115 Wayside Ave-W. Spfld, MA

Laboratory ID

Client Sample ID

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method and meet the requirements of NELAC including any data obtained from a subcontract laboratory. Please note that all solid matrix sample results are calculated on a dry weight basis unless otherwise specified.

This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Authorized by:

Hanibal C. Tayeh
President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: 115 Wayside Ave-W. Spfld, MA

Client: ECS

Lab ID No: AC45715

Client Id: MW-3

Client Project No: 13997

Submittal Date: 5/9/01

Collection Date: 5/9/01

Matrix: Ground Water

Parameter	Results	Units	PQL	Start Date	Analyst	Method
Volatile Organic Compounds						
<i>VOCs by GC/MS</i>						
Acetone	Below det lim	ug/L	100.0	5/14/01	RLJ	SW846 8260B
Acrylonitrile	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Benzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromochloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromodichloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromoform	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromomethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
2-Butanone (MEK)	Below det lim	ug/L	50.0	5/14/01	RLJ	SW846 8260B
n-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
sec-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
tert-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Carbon disulfide	Below det lim	ug/L	5.0	5/14/01	RLJ	SW846 8260B
Carbon tetrachloride	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Chlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Chloroethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
Chloroform	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Chloromethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
2-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
Dibromochloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dibromoethane (EDB)	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Dibromomethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,3-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,4-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Dichlorodifluoromethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
1,1-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
cis-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
trans-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,3-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
2,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOCs by GC/MS						
1,1-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
cis-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
trans-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Ethylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Hexachlorobutadiene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
2-Hexanone (MBK)	Below det lim	ug/L	100.0	5/14/01	RLJ	SW846 8260B
Isopropylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Isopropyltoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Methyl-2-pentanone (MIBK)	Below det lim	ug/L	20.0	5/14/01	RLJ	SW846 8260B
Methylene chloride	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Naphthalene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
n-Propylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Styrene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,1,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,2,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Tetrachloroethene (PCE)	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Toluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,3-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,4-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,1-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,2-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Trichloroethene (TCE)	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Trichlorofluoromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,3-Trichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,4-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,3,5-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Vinyl chloride	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
m,p-Xylenes	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
o-Xylene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Bromofluorobenzene (%SR)	98	ug/L		5/14/01	RLJ	SW846 8260B
1,4-Difluorobenzene (%SR)	103	ug/L		5/14/01	RLJ	SW846 8260B
Chlorobenzene-d5 (%SR)	102	ug/L		5/14/01	RLJ	SW846 8260B
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/L	0.075	5/14/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/L	0.075	5/14/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	5/14/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VPH Target Analytes						
Ethylbenzene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/L	10	5/14/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	NA	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	NA	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	87	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	98	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
TPH Preparation						
Separatory Funnel Extraction	Completed			5/14/01	NA	SW846 3510C
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		5/15/01	MSL	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	65	ug/L	0.	5/15/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	67	ug/L	0.	5/15/01	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	67	ug/L	0.	5/15/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	74	ug/L	0.	5/15/01	MSL	MA EPH 98-1

Collection Date: 5/9/01
Matrix: Ground Water

Lab ID No: AC45715

Client Id: MW-3

Collection Date: 5/9/01

Matrix: Ground Water

[illegible]

Parameter	Results	Units	PQL	Start Date	Analyst	Method
Volatile Organic Compounds						
VOCs by GC/MS						
Acetone	Below det lim	ug/L	100.0	5/14/01	RLJ	SW846 8260B
Acrylonitrile	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Benzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromochloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromodichloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromoform	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Bromomethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
2-Butanone (MEK)	Below det lim	ug/L	50.0	5/14/01	RLJ	SW846 8260B
n-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
sec-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
tert-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Carbon disulfide	Below det lim	ug/L	5.0	5/14/01	RLJ	SW846 8260B
Carbon tetrachloride	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Chlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Chloroethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
Chloroform	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Chloromethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
2-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
Dibromochloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dibromoethane (EDB)	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Dibromomethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,3-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,4-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Dichlorodifluoromethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
1,1-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
cis-1,2-Dichloroethene	9.2	ug/L	1.0	5/14/01	RLJ	SW846 8260B
trans-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,3-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
2,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
cis-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
trans-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Ethylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Hexachlorobutadiene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOCs by GC/MS						
2-Hexanone (MBK)	Below det lim	ug/L	100.0	5/14/01	RLJ	SW846 8260B
Isopropylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Isopropyltoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Methyl-2-pentanone (MIBK)	Below det lim	ug/L	20.0	5/14/01	RLJ	SW846 8260B
Methylene chloride	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Naphthalene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
n-Propylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Styrene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,1,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,2,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Tetrachloroethene (PCE)	10	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Toluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,3-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,4-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,1-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,2-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Trichloroethene (TCE)	3.1	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Trichlorofluoromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,3-Trichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,4-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,3,5-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Vinyl chloride	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
m,p-Xylenes	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
o-Xylene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Bromofluorobenzene (%SR)	100	ug/L		5/14/01	RLJ	SW846 8260B
1,4-Difluorobenzene (%SR)	103	ug/L		5/14/01	RLJ	SW846 8260B
Chlorobenzene-d5 (%SR)	103	ug/L		5/14/01	RLJ	SW846 8260B
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/L	0.075	5/14/01	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/L	0.075	5/14/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	5/14/01	RLJ	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/L	10	5/14/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-12

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VPH Target Analytes						
2,5-Dibromotoluene (%SR) PID	NA	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	NA	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	97	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	100	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
TPH Preparation						
Separatory Funnel Extraction	Completed			5/14/01	NA	SW846 3510C
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		5/15/01	MSL	MA EPH 98-1
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
1-Chlorooctadecane Aliphatic (%SR)	55	ug/L	0.	5/15/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	68	ug/L	0.	5/15/01	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	72	ug/L	0.	5/15/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	81	ug/L	0.	5/15/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	5/15/01	MSL	MA EPH 98-1

Parameter	Results	Units	PQL	Start Date	Analyst	Method
Volatile Organic Compounds						
VOCs by GC/MS						
Acetone	Below det lim	ug/L	100.0	5/14/01	KW	SW846 8260B
Acrylonitrile	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Benzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Bromobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Bromochloromethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Bromodichloromethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Bromoform	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Bromomethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260B
2-Butanone (MEK)	Below det lim	ug/L	50.0	5/14/01	KW	SW846 8260B
n-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
sec-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
tert-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Carbon disulfide	Below det lim	ug/L	5.0	5/14/01	KW	SW846 8260B
Carbon tetrachloride	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Chlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Chloroethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260B
Chloroform	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Chloromethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260B
2-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
4-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260B
Dibromochloromethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2-Dibromoethane (EDB)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Dibromomethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,3-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,4-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Dichlorodifluoromethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260B
1,1-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
cis-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
trans-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,3-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
2,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
cis-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
trans-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Ethylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Hexachlorobutadiene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOCs by GC/MS						
2-Hexanone (MBK)	Below det lim	ug/L	100.0	5/14/01	KW	SW846 8260B
Isopropylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
4-Isopropyltoluene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
4-Methyl-2-pentanone (MIBK)	Below det lim	ug/L	20.0	5/14/01	KW	SW846 8260B
Methylene chloride	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Naphthalene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
n-Propylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Styrene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,1,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,2,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Tetrachloroethene (PCE)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Toluene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2,3-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2,4-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,1-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,2-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Trichloroethene (TCE)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Trichlorofluoromethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2,3-Trichloropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2,4-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,3,5-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Vinyl chloride	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
m,p-Xylenes	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260B
o-Xylene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
4-Bromofluorobenzene (%SR)	89	ug/L		5/14/01	KW	SW846 8260B
1,4-Difluorobenzene (%SR)	102	ug/L		5/14/01	KW	SW846 8260B
Chlorobenzene-d5 (%SR)	95	ug/L		5/14/01	KW	SW846 8260B
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/L	0.075	5/14/01	KW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	KW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	KW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/L	0.075	5/14/01	KW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/L	0.025	5/14/01	KW	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	5/14/01	KW	MA VPH 97-12
VPH Target Analytes						
Benzene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Toluene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/L	10	5/14/01	KW	MA VPH 97-12
o-Xylene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Naphthalene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12

Parameter	Results	Units	PQL	Start Date	Analyst	Method
<i>VPH Target Analytes</i>						
2,5-Dibromotoluene (%SR) PID	na	ug/L	0.	5/14/01	KW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/L	0.	5/14/01	KW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	74	ug/L	0.	5/14/01	KW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	89	ug/L	0.	5/14/01	KW	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	5/14/01	KW	MA VPH 97-12

Parameter	Results	Units	PQL	Start Date	Analyst	Method
-----------	---------	-------	-----	------------	---------	--------

The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

Matrix	<input checked="" type="checkbox"/> Aqueous <input type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:					
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking					
Aqueous Preservative	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> pH \leq 2	<input type="checkbox"/> pH $>$ 2	<input type="checkbox"/> pH adjusted to \leq 2 in lab	Comment:	
Temperature	<input type="checkbox"/> Received on ice	<input checked="" type="checkbox"/> Received cold	<input type="checkbox"/> Received ambient	<input checked="" type="checkbox"/> Recorded temperature: 5°C		

The following outlines the condition of all VPH samples contained within this report upon laboratory receipt.

Matrix	<input checked="" type="checkbox"/> Aqueous <input type="checkbox"/> Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Other:					
Containers	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Broken <input type="checkbox"/> Leaking					
Sample Preservative	Aqueous	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> pH \leq 2 <input type="checkbox"/> pH $>$ 2 Comment:				
	Soil or Sediment	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Samples NOT received in Methanol or air-tight container				ml Methanol/g soil <input type="checkbox"/> 1:1 +/- 25% <input type="checkbox"/> Other:
		<input type="checkbox"/> Samples received in Methanol covering soil <input type="checkbox"/> not covering soil				
		<input type="checkbox"/> Sample received in air-tight container:				
Temperature	<input type="checkbox"/> Received on ice	<input checked="" type="checkbox"/> Received cold	<input type="checkbox"/> Received ambient	<input checked="" type="checkbox"/> Recorded temperature: 5°C		

Were all QA/QC procedures followed as required by the VPH method? Yes ☒ No ☐

Were any significant modifications made to the VPH method, as specified in Section 11.3? No * see below

Were all QA/QC procedures followed as required by the EPH method? Yes ☒ No ☐

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ** see below

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes ☒ No ☐

* Yes, if PID and FID surrogate recoveries are listed as n/a, then that sample was run via GCMS using all QC criteria specified in the method.

** Sample(s) was run via GCMS using all QC criteria specified in the method.

I attest that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Reviewed by:

Quality Service/Quality Assurance Depts.

Validated by:

President/Laboratory Director

5/16/01



SPECTRUM ANALYTICAL, INC.

Featuring

HANIBAL TECHNOLOGY

Laboratory Report Supplement

References

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19 th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT-ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

Acronyms & Abbreviations

AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	SW	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC / MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



SPECTRUM ANALYTICAL, INC.
RETURNING
ANALYTICAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Special Handling: PH
☐ Standard TAT - 7 to 10 business days
☒ Rush TAT - Date Needed: 5/16
All TATs subject to laboratory approval.
Min. 24-hour notification needed for rushes.
All samples are disposed of after 60 days unless otherwise instructed.

Report To: EGS Invoice To: EGS Project No.: 13997
Project Mgr.: Chris Pacent P.O. No.: RQN:
Site Name: 115 Wayside Avenue State: MA
Location: West Springfield
Sampler(s): S. Rising

1=Na₂S₂O₃ 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=Ascorbic Acid
7=CH₃OH 8=NaHSO₄ 9= 10=

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1= X2= X3=

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:
AC45715	MW-3	5/9	
AC45716	MW-2	5/9	
AC45717	Trip	5/9	
AC			
AC			
AC			
AC			
AC			
AC			
AC			

Matrix Type

Preservative

of VOA Vials
of Amber Glass
of Clear Glass
of Plastic

Containers

Analyses

Notes

EPH
VPH
VOC 8260B

Relinquished by: Shawn Rising Received by: John K. Zink
Date: 5/9 Time: 3:35PM

☒ Fax results when available to (413) 789-2776

☐ E-mail results when available to

Condition upon Receipt: ☐ Iced ☐ Ambient ☒ 5°C

APPENDIX D

Ball of Lading



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

BWSC-012A

411

Release Tracking Number*

1 - 13697

A. LOCATION OF SITE OR DISPOSAL SITE WHERE REMEDIATION WASTE WAS GENERATED:

Release Name (optional):

Street: 115 Wayside Avenue

Location Aid:

City/Town: West Springfield

ZIP Code: 01089

Date/Period of Generation: 4/23/01 to: 4/25/01

Additional Release Tracking Numbers Associated with this Bill of Lading: 1-13747

* Note: If this Bill of Lading is the result of a Limited Removal Action (LRA) taken prior to Notification, a Release Tracking Number is not needed.

B. PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH BILL OF LADING:

Name of Organization: T Works Realty Group

Name of Contact: Robert Townsend

Title: Owner

Street: 13 Southbridge Drive

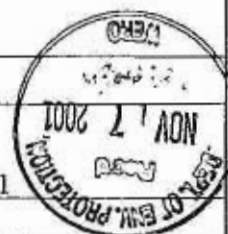
City/Town: Agawam

State: MA

ZIP Code: 01001

Telephone: (413) 789-7794

Ext.:



C. RELATIONSHIP TO RELEASE OF PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH BILL OF LADING:

☒ RP or PRP Specify: ☐ Owner ☒ Operator ☐ Generator ☐ Transporter Other RP or PRP:

☐ Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ Other Person:

If an owner and/or operator is not conducting the response action associated with the Bill of Lading, provide on an attachment the name, contact person, address and telephone number, including any area code and extension, for each, if known.

D. TRANSPORTER OR COMMON CARRIER INFORMATION:

Transporter/Common Carrier Name: Oil Recovery

Contact Person: John Gagnon

Title: President

Street: 138 Palmer Avenue

City/Town: West Springfield

State: MA

ZIP Code: 01089

Telephone: (413) 737-2949

Ext.:

E. RECEIVING FACILITY/TEMPORARY STORAGE LOCATION:

Operator/Facility Name: Ondricks Construction

Contact Person: Paul Mullen

Title: Contact

Street: 58 Industry Road

City/Town: Chicopee

State: MA

ZIP Code: 01020

Telephone: (413) 592-2081

Ext.:

Type of Facility: ☒ Asphalt Batch/Cold Mix

☐ Landfill/Disposal

☐ Incinerator

☐ Temporary Storage

☐ Asphalt Batch/Hot Mix

☐ Landfill/Daily Cover

☐ Other:

☐ Thermal Processing

☐ Landfill/Structural Fill

EPA Identification #: MV4135922081

Division of Hazardous Waste/Class A Permit #: WR-96-07

Division of Solid Waste Management Permit #:

Actual/Anticipated Period of Temporary Storage (specify dates if applicable):

to:

Reason for Temporary Storage:



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

BWSC-012A

411

Release Tracking Number*

I - 13697

E. RECEIVING FACILITY/TEMPORARY STORAGE LOCATION (continued):

Temporary Storage Address:

Street: _____

City/Town: _____ State: _____ ZIP Code: _____

F. DESCRIPTION OF REMEDIATION WASTE:

(check all that apply)

- ☒ Contaminated Media (check all that apply): ☒ Soil ☐ Groundwater ☐ Surface Water ☐ Other: _____
- ☐ Contaminated Debris (check all that apply): ☐ Vegetation or Organic Debris ☐ Demolition/Construction Waste
- ☐ Inorganic Absorbent Materials ☐ Other: _____
- ☐ Non-hazardous Uncontainerized Waste (check all that apply): ☐ Non-aqueous Phase Liquid ☐ Other: _____
- ☐ Non-hazardous Containerized Waste (check all that apply): ☐ Tank Bottoms/Sludges ☐ Containers ☐ Drums
- ☐ Engineered Impoundments ☐ Other: _____

Type of Contamination (check all that apply): ☒ Gasoline ☒ Diesel Fuel ☐ #2 Oil ☐ #4 Oil ☐ #6 Oil ☐ Waste Oil

☐ Kerosene ☐ Jet Fuel ☐ Other: _____

Estimated Volume of Materials: Cubic Yards: 250 Tons: _____ Other: _____

Contaminant Source (check one/specify): ☐ Transportation Accident ☒ Underground Storage Tank ☐ Other: _____

Response Action Associated with Bill of Lading (check one): ☒ Immediate Response Action ☐ Release Abatement Measure

☐ Utility-Related Abatement Measure ☐ Limited Removal Action ☐ Comprehensive Response Action ☐ Other: _____

Remediation Waste Characterization Support Documentation attached:

☒ Site History Information ☒ Sampling and Analytical Methods and Procedures ☒ Laboratory Data ☐ Field Screening Data

If supporting documentation is not appended, provide an attachment stating the date and in connection with what document such information was previously submitted to DEP.

G. LICENSED SITE PROFESSIONAL (LSP) OPINION:

Name of Organization: SEE ATTACHED

LSP Name: _____ Title: _____

Telephone: _____ Ext.: _____

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this submittal, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of

- (i) the standard of care in 309 CMR 4.02(1),
(ii) the applicable provisions of 309 CMR 4.02(2) and (3), and
(iii) the provisions of 309 CMR 4.03(5),

to the best of my knowledge, information and belief, the assessment actions undertaken to characterize the Remediation Waste which is (are) the subject of this submittal for acceptance at the facility identified in this submittal comply with the applicable provisions of 310 CMR 40.0000, and such facility is permitted to accept Remediation Waste having the characteristics described in this submittal. I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

LSP Signature: _____ Seal: _____

Date: _____

License Number: _____



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-012A

411

Release Tracking Number*

BILL OF LADING (pursuant to 310 CMR 40.0030)

1 - 13697

H. CERTIFICATION OF PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:

I certify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

Signature:

Robert Townsend

Date:

4-27-01

Name of Person (print):

Robert Townsend



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-012B

411

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number

SUMMARY SHEET 1 OF 4

1 - 13697

I. LOAD INFORMATION		Receiving Facility/Temporary Storage Representative:	
Load 1:	Signature of Transporter Representative:	SMH	
Date of Shipment:	Time of Shipment:	Date of Receipt:	Time of Receipt:
4-30-01	7:15 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	4-30-01	7:55 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):	20.8 TON TONS
30239			
Load 2:	Signature of Transporter Representative:	SMH	
Date of Shipment:	Time of Shipment:	Date of Receipt:	Time of Receipt:
4-30-01	7:15 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	4-30-01	7:56 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):	15.31 TONS
42481			
Load 3:	Signature of Transporter Representative:	SMH	
Date of Shipment:	Time of Shipment:	Date of Receipt:	Time of Receipt:
4/30/01	7:15 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	4-30-01	7:58 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):	17.25 TON
42686			
Load 4:	Signature of Transporter Representative:	TML	
Date of Shipment:	Time of Shipment:	Date of Receipt:	Time of Receipt:
4-30-01	8:00 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	4-30-01	8:25 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):	18.60 TONS
36941 MA	71341 MA		
Load 5:	Signature of Transporter Representative:	TML	
Date of Shipment:	Time of Shipment:	Date of Receipt:	Time of Receipt:
4-30-01	8:35 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	4-30-01	8:50 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):	21.05 TONS
30239			
Load 6:	Signature of Transporter Representative:	TML	
Date of Shipment:	Time of Shipment:	Date of Receipt:	Time of Receipt:
4-30-01	8:35 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	4-30-01	9:00 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):	17.88 TONS
J. LOG SHEET VOLUME INFORMATION:		Total Volume Recorded This Page (cu. yds./tons): 110.96	
		Total Carried Forward (cu. yds./tons):	
		Total Carried Forward and This Page (cu. yds./tons): 110.96	



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-012B

BILL OF LADING (pursuant to 310 CMR 40.0030)
LOG SHEET 2 OF 4

Release Tracking Number:

1-13697

I. LOAD INFORMATION:

LOAD 1: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 8:45 (circle one) am/pm
Truck/Tractor Registration: 42680 Trailer Registration (if any):

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 4/30/01 Time of Receipt: 9:00 (circle one) am/pm
Load Size (cu. yds./tons): 16.64 TONS

LOAD 2: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 10:00 (circle one) am/pm
Truck/Tractor Registration: 36941 MA Trailer Registration (if any): 2LP41 MA

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 4/30/01 Time of Receipt: 10:10 (circle one) am/pm
Load Size (cu. yds./tons): 24.67 TONS

LOAD 3: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 10:00 (circle one) am/pm
Truck/Tractor Registration: 42481 Trailer Registration (if any):

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 4/30/01 Time of Receipt: 10:27 (circle one) am/pm
Load Size (cu. yds./tons): 17.26 TONS

LOAD 4: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 10:05 (circle one) am/pm
Truck/Tractor Registration: 42686 Trailer Registration (if any):

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 4/30/01 Time of Receipt: 10:30 (circle one) am/pm
Load Size (cu. yds./tons): 17.79 TONS

LOAD 5: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 10:10 (circle one) am/pm
Truck/Tractor Registration: 30239 Trailer Registration (if any):

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 4/30/01 Time of Receipt: 10:36 (circle one) am/pm
Load Size (cu. yds./tons): 18.52 TONS

LOAD 6: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 11:00 (circle one) am/pm
Truck/Tractor Registration: 42481 Trailer Registration (if any):

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 4/30/01 Time of Receipt: 11:21 (circle one) am/pm
Load Size (cu. yds./tons): 16.44 TONS

LOAD 7: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 11:00 (circle one) am/pm
Truck/Tractor Registration: 42686 Trailer Registration (if any):

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 4/30/01 Time of Receipt: 11:26 (circle one) am/pm
Load Size (cu. yds./tons): 16.94 TONS

J. LOG SHEET VOLUME INFORMATION:

Total Volume This Page (cu. yds./tons): 128.26 TON

Total Carried Forward (cu. yds./tons): 110.96 TON

Total Carried Forward and This Page (cu. yds./tons): 239.22 TON



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-012B

BILL OF LADING (pursuant to 310 CMR 40.0030)
LOG SHEET 3 OF 4

Release Tracking Number:

1 - 13697

I. LOAD INFORMATION:

LOAD 1: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 11:20

(circle one) am/pm

Truck/Tractor Registration:

Trailer Registration (if any):

LOAD 2: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 11:45 AM

(circle one) am/pm

Truck/Tractor Registration:

Trailer Registration (if any):

LOAD 3: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 11:50

(circle one) am/pm

Truck/Tractor Registration:

Trailer Registration (if any):

LOAD 4: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 11:55

(circle one) am/pm

Truck/Tractor Registration:

Trailer Registration (if any):

LOAD 5: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 12:05

(circle one) am/pm

Truck/Tractor Registration:

Trailer Registration (if any):

LOAD 6: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 12:40

(circle one) am/pm

Truck/Tractor Registration:

Trailer Registration (if any):

LOAD 7: Signature of Transporter Representative:

Date of Shipment: 4/30/01 Time of Shipment: 12:45

(circle one) am/pm

Truck/Tractor Registration:

Trailer Registration (if any):

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt:

4/30/01

11:40

Load Size (cu. yds./tons):

1838 TONS

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt:

4/30/01

12:56

Load Size (cu. yds./tons):

17.42 TONS

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt:

4/30/01

12:10

Load Size (cu. yds./tons):

1600 TONS

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt:

4/30/01

12:22

Load Size (cu. yds./tons):

19.33 TONS

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt:

4/30/01

12:21

Load Size (cu. yds./tons):

17.61 TONS

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt:

4/30/01

1:21

Load Size (cu. yds./tons):

16.63 TON

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt:

4/30/01

1:26

Load Size (cu. yds./tons):

17.92 TON

J. LOG SHEET VOLUME INFORMATION:

Total Volume This Page (cu. yds./tons): 122.79 TONS

Total Carried Forward (cu. yds./tons): 239.22 TONS

Total Carried Forward and This Page (cu. yds./tons): 362.01 TONS



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-012B

BILL OF LADING (pursuant to 310 CMR 40.0030)
LOG SHEET 4 OF 4

Release Tracking Number:

1 - 13697

I. LOAD INFORMATION:

LOAD 1: Signature of Transporter Representative: [Signature]

Receiving Facility/Temporary Storage Representative: TML

Date of Shipment: 4/30/01 Time of Shipment: 7:05 (circle one) am/pm

Date of Receipt: 4/30/01 Time of Receipt: 12:30 (circle one) am/pm

Truck/Tractor Registration: 30234 Trailer Registration (if any):

Load Size (cu. yds./tons): 18.27 tons

LOAD 2: Signature of Transporter Representative: [Signature]

Receiving Facility/Temporary Storage Representative: TML

Date of Shipment: 4/30/01 Time of Shipment: 2:00 (circle one) am/pm

Date of Receipt: 4/30/01 Time of Receipt: 2:23 (circle one) am/pm

Truck/Tractor Registration: 42451 Trailer Registration (if any):

Load Size (cu. yds./tons): 19.16 tons

LOAD 3: Signature of Transporter Representative: [Signature]

Receiving Facility/Temporary Storage Representative: TML

Date of Shipment: 4/30/01 Time of Shipment: 2:00 (circle one) am/pm

Date of Receipt: 4/30/01 Time of Receipt: 2:26 (circle one) am/pm

Truck/Tractor Registration: 42451 Trailer Registration (if any):

Load Size (cu. yds./tons): 16.53 tons

LOAD 4: Signature of Transporter Representative: [Signature]

Receiving Facility/Temporary Storage Representative: TML

Date of Shipment: 4/30/01 Time of Shipment: 2:45 (circle one) am/pm

Date of Receipt: 4/30/01 Time of Receipt: 3:02 (circle one) am/pm

Truck/Tractor Registration: 30234 Trailer Registration (if any):

Load Size (cu. yds./tons): 12.31

LOAD 5: Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Shipment: / / Time of Shipment: : (circle one) am/pm

Date of Receipt: / / Time of Receipt: : (circle one) am/pm

Truck/Tractor Registration: Trailer Registration (if any):

Load Size (cu. yds./tons):

LOAD 6: Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Shipment: / / Time of Shipment: : (circle one) am/pm

Date of Receipt: / / Time of Receipt: : (circle one) am/pm

Truck/Tractor Registration: Trailer Registration (if any):

Load Size (cu. yds./tons):

LOAD 7: Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Shipment: / / Time of Shipment: : (circle one) am/pm

Date of Receipt: / / Time of Receipt: : (circle one) am/pm

Truck/Tractor Registration: Trailer Registration (if any):

Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:

Total Volume This Page (cu. yds./tons): 66.27 tons

Total Carried Forward (cu. yds./tons): 362.01 tons

Total Carried Forward and This Page (cu. yds./tons): 428.28 tons



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-012C

411

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number

SUMMARY SHEET

1 - 13697

ONLY COMPLETE ONE COPY OF THIS PAGE AND ATTACH TO THE FINAL COPY OF THE SUMMARY SHEET.

L. ACKNOWLEDGMENT OF RECEIPT OF REMEDIATION WASTE AT RECEIVING FACILITY OR TEMPORARY STORAGE:

Receiving Facility/Temporary Storage Representative (print):

Paul Mullen

Title: Contact Person

Signature:

Date:

5/2/01

M. ACKNOWLEDGMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON
CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:

I certify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

Signature:

Date:

4-27-01

Name of Person (print):

Robert Townsend

Use LSP Replacement Opinion V with the following BWSC Form:

o Bill of Lading (BWSC-012A)

LSP Replacement Opinion V

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this submittal, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of

- (i) the standard of care in 309 CMR 4.02(1),
- (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and
- (iii) the provisions of 309 CMR 4.03(5),

to the best of my knowledge, information and belief, the assessment actions undertaken to characterize the Remediation Waste which is (are) the subject of this submittal for acceptance at the facility identified in this submittal comply with the applicable provisions of 310 CMR 40.0000, and such facility is permitted to accept Remediation Waste having the characteristics described in this submittal. I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

Release Tracking Number: 1 - 13697

LSP Name: Kevin C. Sheehan

Title: Principal

LSP Organization: Environmental Compliance Services, Inc.

Date: 9/27/01

Telephone/Ext: 413 780 3530

Seal:

Signature: [Handwritten Signature]



APPENDIX E

Groundwater Sampling Logs

Environmental Contingencies Services, Inc.
508 Silver Street, Agawam, Massachusetts 01001
MA: (413) 789-3530 FAX: (413) 789-2776

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: _____
Location: 115 Wayside Ave W. Springfield, MA
Personnel: S. Rising

Job Number: 13997
Date: 5/8/01
Weather Conditions: Sunny 80°F

WELL I.D.
MW-2

Volume Purged (gallons)	Sample Time (minutes)	TEMP. Degrees (Celsius)	pH	Specific Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	mV millivolts	Drawdown <0.3 feet	Depth to Water PVC/RIM	Depth of Well PVC/RIM	Standing Water (feet)	Middle of Saturated Zone (feet)	Static Volume (gallons)	Minimum Purge Volume (gallons)	Observations
	Inch Dia. Casing							12.29	25.61					
CELL	2.0	10.77	6.38	0.331	6.49	469								
	4.0	10.62	6.39	0.331	5.95	472								
	6.0	10.50	6.41	0.310	5.80	474								
	8.0	10.47	6.41	0.310	5.75	474								
	10.0	10.42	6.42	0.312	5.71	475								
	12.0	10.35	6.42	0.320	5.62	475								
	14.0	10.40	6.42	0.326	5.48	475								
	16.0	10.30	6.38	0.326	5.53	475								
	18.0	10.18	6.38	0.332	5.82	476								
	20.0	10.14	6.38	0.321	5.76	476								
	22.0	10.16	6.39	0.321	5.67	476								

Notes/Calculations

Forged 4.0 gal.

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: _____
Location: 115 Weyside Ave W. Spfld
Personnel: S. Rising

Job Number: 13997
Date: 5/9/01
Weather Conditions: Sunny 80°F

WELL I.D.
MW-3

[illegible]

Notes/Calculations:

Purged 4.0 gal.

APPENDIX F

OHM Properties

PROPERTIES OF CONTAMINANTS

	CAS	MP/C	Solubility	VP	HC	Density	DV	KV	K _{ow}	K _{oc}	B	Rfd	Transformation Products
EPH													
C5-C8 aliphatics	VPH	-94.6	1.10E+01	1.00E-01	5.40E+01	93	ND	ND	-0.24	2285	N-P	6.00E-01	None Known
C9-C12 aliphatics	VPH	-86.9	7.00E-02	8.70E-04	5.50E+01	149	ND	ND	0.26	1.5 X 10 ⁵	N-P	6.00E+00	peroxyacetyte nitrate, methyl nitrate
C9-C10 aromatics	VPH	9.8	5.10E+01	2.90E-03	3.30E-01	120	ND	ND	1.76	1778	N-P	3.00E-03	ethylene, bromide ions, ethylene glycol
Volatiles Aromatics													
benzene	71-43-2	5.5	1.78E+03	7.60E+01	5.43E-03	.8765	.8468	.7379	2.13	1.81	N-P-D	5.00E-03	cis-benzene glycol
toluene	108-88-3	-95.1	5.15E+02	2.20E+01	5.61E-03	.8689	.58	.669	2.73	2.41	N-P-D	2.00E-01	cis-2,3-dihydroxy-1-methylcyclohexa-1,4-diene
ethylbenzene	100-41-4	-94.97	1.52E+02	7.00E+00	7.90E-03	.867	.678	.782	3.15	2.83	D-A	1.00E-01	No data found
m-xylene	108-38-3	-50	2.00E+02	8.00E+00	6.91E-03	.8642	.608	.717	3.2	2.84	N-P	2.00E+00	3-methyl-benzyl alcohol
o-xylene	95-47-6	-25	1.70E+02	7.00E+00	4.94E-03	.88	.802	.932	3.12	2.84	N-P	2.00E+00	No data found
p-xylene	106-42-3	13	1.98E+02	9.00E+00	7.01E-03	.861	.635	.753	3.15	2.84	N-P	2.00E+00	4-methylbenzyl alcohol
EPH													
C9-C18 aliphatics	EPH	-94.6	1.00E-02	1.40E-04	6.90E+01	170	ND	ND	-0.24	6.8 x 10 ⁵	N-P	6.00E-01	None Known
C19-C36 aliphatics	EPH	-86.9	NA	NA	NA	NA	ND	ND	0.26	NA	N-P	6.00E+00	peroxyacetyte nitrate, methyl nitrate
C11-C22 aromatics	EPH	9.8	5.80E+00	3.20E-05	3.00E-02	150	ND	ND	1.76	5000	N-P	3.00E-03	ethylene, bromide ions, ethylene glycol
Semi-Volatiles													
naphthalene	91-20-3	80.2	3.10E+01	2.18E+02	1.27E-03	1.162	NA	NA	3.3	3.11	D	4.00E-02	1-naphthol, cis-1,2-dihydroxy-1,2-dihydronaphthalene
Non-Halogenated Semi-Volatiles													
acenaphthene	83-32-9	92.5	3.88E+00*	2.79E+02	1.46E+01	1.225	NA	NA	3.92	3.7	D	ND	No data found
anthracene	120-12-7	216.3	7.5E-02*	3.40E+02	1.40E+02	1.25	NA	NA	4.45	4.1	A	ND	No data found
fluoranthene	206-44-0	107	2.65E-01*	1.00E-02	6.50E-06	1.252	NA	NA	4.9	4.58	A,N	4.00E-02	No data found
fluorene	86-73-7	116.7	1.90E+00*	2.98E+02	2.10E+01	1.203	NA	NA	4.18	3.9	A	ND	No data found
2-methylnaphthalene	91-57-6	34.58	2.54E+01*	6.80E-02*	5.06E-02*	1.0058	NA	NA	3.86	3.93	ND	4.00E-02	No data found
phenanthrene	85-01-8	100	1.18E+00	2.01E-04*	3.98E-05*	.98	NA	NA	4.46	4.1	D	4.00E-02	catechol
pyrene	129-00-0	150	1.48E-01*	6.67E-06*	1.20E-05*	1.271	NA	NA	4.68	4.58	D,N	ND	No data found
Notes:													
		VP = vapor point	HC = Henry's Constant			D = density							
		KV = kinematic viscosity				Kow = Octanol/Water Partition Coefficient (log)							
		B = biodegradation potential	Rfd = Chronic Oral reference dose			DV = dynamic viscosity							
		NA = not applicable	ND = No data found	Neg = Negligible		MP = melting point							
						Koc = Organic Carbon Partition Coefficient (log)							
						*Values at 20° C unless otherwise noted							
Biodegradation Notes:													
		P = persistent	N-P = non persistent	A = significant degradation with gradual adaption									
		B = slow to moderate activity	attending significant volatilization rate										
		N = not significantly degraded	precluded by extensive volatilization rate										
Sources													
		USEPA Subsurface Remediation Guidance. EPA/540/2-90/011b. 1991											
		Montgomery, John H. Groundwater Chemicals Desk Reference. Lewis Publishers, Inc. 1990											
		Massachusetts Contingency Plan 310 CMR 40.000											
		Massachusetts DEP Documentation for the Risk Assessment Short Form, October 1992											

PROPERTIES OF CONTAMINANTS

	CAS	MP/C°	Solubility*	VP	HC	Density	DV	KV	K _{ow}	K _{oc}	B	Rtd	Transformation Products
Volatile Organic Compounds													
Tetrachloroethene	127-18-4	-19	1.50E+02	1.40E+01	1.53E-02	6.78	ND	ND	2.6	2.42	N	1.00E-02	TCE, cis-1,2-dichloroethene, trans-1,2-dichloroethene, vinyl chloride
Trichloroethene	79-01-8	-73	1.10E+03	5.40E+00	9.10E-03	1.4842	ND	ND	2.53	1.81	N	2.00E-03	cis-1,2-dichloroethene, trans-1,2-dichloroethene, vinyl chloride
1,1-dichloroethane	75-34-3	-97.4	5.50E+03	1.82E+02	4.30E-03	4.04	ND	ND	1.78	1.48	N	1.00E-01	Vinyl Chloride
trans-1,2-dichloroethene	150-00-5	-50	6.00E+02	2.85E+02	3.84E-01	1.2565	ND	ND	2.09	1.77	N	2.00E-02	Vinyl Chloride
cis-1,2-dichloroethene	156-59-2	-80.5	3.50E-01	2.40E+01	ND	1.2837	ND	ND	1.86	ND	N	1.00E-02	ND
1,1-Dichloroethane	75-35-4	-122.1	4.00E+02	4.95E+02	2.10E-02	1.218	ND	ND	2.13	1.81	N	9.00E-03	1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, vinyl chloride
1,1,1-trichloroethane	71-35-6	-30.4	4.40E+03	1.00E+02	1.50E-02	1.20	ND	ND	1.76	1.78	N	9.00E-02	ethylene glycol
Notes:	VP = vapor point KV = kinematic viscosity B = biodegradation potential NA = not applicable HC = Henry's Constant D = density Kow = Octanol/Water Partition Coefficient (log) Rtd = Chronic Oral reference dose ND = No data found Neg = Negligible DV = dynamic viscosity MP = melting point Koc = Organic Carbon Partition Coefficient (log)												
Biodegradation Notes:	P = persistent B = slow to moderate activity attending significant volatilization rate N = not significantly degraded/precluded by extensive volatilization rate USEPA Subsurface Remediation Guidance, EPA/540/2-90/011b, 1991 Montgomery, John H. Groundwater Chemicals Desk Reference, Lewis Publishers, Inc. 1990 Massachusetts Contingency Plan 310 CMR 40.0000 Massachusetts DEP Documentation for the Risk Assessment Short Form, October 1992												
Sources													